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PART I.　　　　　　　　　　　　　　　　[*Price 21s. coloured.*

NEREIS AUSTRALIS,

OR

ALGÆ OF THE SOUTHERN OCEAN:

BEING

FIGURES AND DESCRIPTIONS

OF

MARINE PLANTS, COLLECTED ON THE SHORES OF THE CAPE OF GOOD HOPE, THE EXTRA-TROPICAL AUSTRALIAN COLONIES, TASMANIA, NEW ZEALAND, AND THE ANTARCTIC REGIONS;

DEPOSITED IN THE

HERBARIUM OF THE DUBLIN UNIVERSITY.

BY

WILLLIAM HENRY HARVEY, M.D., M.R.I.A.,
Keeper of the Dublin Herbarium.

LONDON:
REEVE, BROTHERS, KING WILLIAM STREET, STRAND.

1847.

9.d.1.

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> ———"Si ex his studiis delectatio sola peteretur: tamen, ut opinor, hanc animi remissionem, humanissimam ac liberalissimam judicaretis."—*Cicero.*

LONDON:
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1847.

——————“ The love of Nature’s works
Is an ingredient in the compound, man,
Infused at the creation of the kind.
And though the Almighty Maker has throughout
Discriminated each from each, by strokes
And touches of his hand with so much art
Diversified, that two were never found
Twins at all points; yet this obtains in all.
That all discern a beauty in his works
And all can taste them. Minds that have been formed
And tutor’d, with a relish more exact,
But none without some relish, none unmoved.”—*Cowper.*

BODLEIANA BIBLIOTHECA

TO

THE PROVOST AND SENIOR FELLOWS

OF

THE UNIVERSITY OF DUBLIN

THIS VOLUME

DESIGNED TO ILLUSTRATE A SMALL, BUT INTERESTING PORTION

Of their Museum

IS VERY RESPECTFULLY INSCRIBED

BY THEIR OBEDIENT AND

FAITHFUL SERVANT,

THE AUTHOR.

PREFACE.

At the commencement of the present century, the extra-tropical dependancies of the British Crown were confined to the Cape of Good Hope, and the germ of a Settlement in Australia: before it is half over our position is so greatly changed, that we may, with confidence, anticipate the day when a British population shall be dispersed throughout all habitable countries washed by the Southern Ocean. The coast-line of our possessions in South Africa has been extended eastwards as far as Port Natal, more than a thousand miles, and the jurisdiction of the Colonial Courts is felt northward to the 25° lat., although the intervening territory has not yet been regularly occupied by Europeans. The Australian continent is gradually being girded with settlements along its western, southern and eastern shores, while its interior resources are more and more opened up to us by the enterprising exertions of pioneers in the wilderness; and though great portions of it are still unexplored, all that can be made available is marked out for British occupation. Tasmania is so closely connected by climate and natural productions, as well as by position, with Continental Australia, that it forms one of its natural dependancies. Further to the east, on the southern limits of the Pacific, the fertile islands of New Zealand, formerly known to us only as the abode of the fiercest savages, have been brought under our influence, and are gradually settling down into an orderly British province, destined to become, at a future day, the great civilizing power in Polynesia. Near the extremity of America, the tree-less, but grassy, Falklands, with a climate analogous to that of Shetland, have at length been occupied, and their neglected harbours are now available to British shipping. Continuing our line round the world, the isolated island-mountain of Tristan D'Acunha, between America and the Cape of Good

Hope concludes this rapid enumeration of the extra-tropical portion of the British Empire. But countries beyond our sway, and too inhospitable for even mercantile enterprise to seek a settlement upon, have sent their tribute to the British naturalist. The Antarctic shores, ice-bound and rocky, are, through the exertions of the indefaticable naturalists attached to the Expedition under Sir J. Clarke Ross, comparatively well known to us, and their productions have been elaborately illustrated in one of the most beautiful, as well as important, scientific works of modern times, the 'Flora Antarctica'.

To the British naturalist, this great extension of our colonial empire offers peculiar facilities. Our intercourse with southern lands has now become so frequent and so intimate; so many have friends or relatives settled on various points of the Australian coasts, who carry with them into their new home the taste for natural history, which is daily becoming more diffused in Europe, that observers, well qualified for the task are not wanting, and collectors are numerous in many distant and well situated localities. Countries from which facts of natural history have long been desiderata, snatched at, perhaps by the casual voyager, but never observed in detail, by being converted into permanent British Settlements, become soon comparatively well known to us. So endless are the productions, both of sea and land in these favoured latitudes, and the former, especially, are, as yet, so imperfectly explored, that in no country equally accessible can the botanist, and especially the *marine* botanist, find a field to work upon which will yield him better fruit, or furnish to the science which he cultivates, more important and interesting results. Here nature luxuriates in new and sportive forms; in aspect startlingly dissimilar from what we of the old world are conversant with, but connected by the delicate web of affinity, in a manner often little expected by the common observer, and only discoverable by those who delight to trace, in the endless variety of natural forms, the unity of design which distinguishes the whole.

The flowering plants and ferns of our Australian possessions have been extensively collected, and with their more striking forms few botanists are unacquainted; but it is far otherwise with the vegetable productions of the sea, which, with few exceptions, it has been the fashion to neglect, as if they were wholly worthless. The unmerited stigmas "Alga inutilis" and "projecta vilior Alga" have, it would appear, been retained by the majority of modern botanists, and even by many who do not consider other cryptogamous plants unworthy their notice. Yet the history of the Algæ affords many salient points of interest, especially in its bearings upon that of the lower, and quasi-vegetable members of the animal kingdom; while the mere admirers of exquisite form, delicate structure, and brilliant colour, will in no tribe of plants find more ample food for admiration. Algæ, too, have the recommendations which shells possess to the amateur collector, that of being easily preserved, and of the specimen retaining, in most cases, a large proportion of its living beauty. So that instead of being the most neglected class of plants, one might be prepared to find them the special favourites of collectors.

One reason which has hitherto operated against their more extensive study, has doubtless been the want of books, illustrated by figures, affording detailed descriptions of them. Such works, with the exception of the 'Historia Fucorum' of Turner—the foundation of our knowledge of these plants, and the passing chapters devoted to Algæ in modern scientific voyages, expensive, and difficult of access, and necessarily imperfect,—have hitherto been confined to illustrations of the marine botany of Europe, whose shores have long been zealously explored by a succession of observers. To supply in some degree, as far as our southern colonies are concerned, this acknowledged want, and by placing descriptions, accompanied by figures, in the hands of our fellow subjects resident beyond the tropics, to afford them the means of acquiring some acquaintance with this branch of botany, and of extending our acquaintance with it; these have been my principal motives in undertaking the present work, and I shall feel myself fully compensated if my feeble efforts towards these objects should lead to a greater attention being paid to the marine plants of the south, by persons whose residence affords them the opportunity of collecting. The sketch now given of the marine botany of this great ocean, which covers nearly a third of the earth's surface, is necessarily extremely imperfect, but considered as a sketch, it may serve to give a general idea of the principal features of the Southern marine Flora. Many new genera doubtless remain to be introduced, and as many new species, probably, as would swell the volume to more than thrice its size. Time, and the exertions of collectors in our colonies, will supply much novelty, and should I be intrusted with sufficient materials to enable me to undertake a more full marine Flora, it is a work which I shall gladly attempt, and towards which I shall be most glad to receive contributions of specimens. Meantime, as occasion is afforded, I propose to publish in Hooker's 'London Journal of Botany', any minor collections with which I shall be favoured, giving due credit to those by whom they have been transmitted.

But as many persons may be discouraged from collecting Algæ, by supposing that it is a troublesome or difficult matter, I shall here give a few plain directions, such as any one may follow. When Algæ are merely collected for the purpose of being sent to Europe, and the collector himself does not feel so much interest in the subject as to induce him to be at the trouble of carefully preparing them for the herbarium, a very simple and quick mode of preparation may be adopted. When gathered from the rocks, or from the beach, the specimens should be spread out thinly, without any previous washing, and without squeezing, but exactly as they have come from the sea, to dry in some place exposed to the sun and air; and thus they may be left, without further care, till they are completely dry, and shrivelled up to the smallest compass to which they will shrink. Care must be taken, however, to allow them *thoroughly* to shrink, and to become so dried that there may be no risk of a fermentation taking place. This, in warm countries, will happen after a couple of days exposure. The shrivelled bundles, whose beauty is now under cover, and to all appearance gone for ever, are to be packed *loosely* in old boxes or casks, with a few twigs interposed between the layers to keep them from becoming too closely matted together, and in that manner they may be sent home. So sent, they will arrive in Europe in an excellent condition, and the great majority recover their form and other characters on being soaked in water, and may then be prepared as specimens for the cabinet. The salt which they contain preserves them from decay, and keeps them by its slight deliquescence, in a pliant state. In forming such rough collections some judgment is necessary; though in new countries all should be collected, the larger and coarser as well as the more delicate, yet particular attention should be paid to those which grow nearest to low-water mark, and all rocky coasts should be explored at the low water of spring tides. Multitudes of delicate plants are found fringing the tidal limit which do not occur at a higher level. The margins of deep pools left among the rocks are also favourite habitats. On sandy shores, and in bays, great numbers of excellent specimens may be secured when freshly thrown up from the sea; but pickings from belts of sea-weed which have been long rolled together by the waves, and are already attacked by flies, should be very cautiously made, and everything rejected in which decay has already made progress. Finally, and specially, in gathering from the rocks, be careful to secure the *whole* plant, from the very root, and to preserve it, if possible, unbroken. Where boats can be made use of, collectors may obtain a great many deep-water species, which are rarely thrown up in a perfect state, by dredging with a common oyster dredge, in four to fifteen fathoms; or by dragging after the boat a set of iron hooks, weighing from six to eight lbs., attached to a rope. These, catching in the large plants, readily bring them to the surface, often accompanied by a host of interesting parasitical species.

Persons who wish to form collections to be kept for their own pleasure, must use a different mode of preparation, or *mounting* for the cabinet. A few instructions on this operation may therefore be desirable. When Algæ are brought home from the shore, they should be sorted according to size and delicacy, large and coarse kinds being kept by themselves. The coarse or olive kinds require to be steeped for two, three, or several days, in fresh-water, changed once a day, for the purpose of extracting their salt. They are then to be placed between sheets of soft paper, under pressure, much in the manner of land plants, and the papers renewed till the specimens are fully dried. The only care necessary with them is to display their branches and leaves properly, while the specimen is yet moist. The more delicate kinds, including most of those of a red colour, must be very cautiously treated with fresh water, and left for a very short time in it. The smaller filamentous kinds, which rapidly decompose in the air, should always be collected in wide-mouthed bottles, brought to the shore for that purpose, and filled with sea-water, and they should be kept in vessels of sea-water until just before they are to be dried. The larger red kinds may be brought home in collecting bags, baskets, or boxes, and may be steeped in fresh water from half an hour to two hours, according to species, before drying. The collector should have at hand a couple of large flat white dishes, filled with water, in one of which the specimens may be washed, pruned, and freed from parasites, and singly introduced into the other, when sufficiently cleaned. When the specimen is floated in the second dish, a piece of white paper of proportionate size is to be introduced under it, the branches carefully displayed with a fine pointed instrument, a porcupine's quill or small forceps, and the superfluous parts removed. The paper, with the specimen so displayed upon it, is then carefully to be withdrawn from the water, placed between sheets of soft paper, and subjected to pressure like other plants. Thin calico rags are useful to lay immediately over the specimens, between them and the soaking-paper, as the cloth is less likely to adhere to their surface than paper, and if it does adhere, is more readily removed without injury. After the first six hours, and again once every day till the specimens are fully dry, the wet paper must be changed, and then it will be found, in most cases, that the specimen has adhered to the white paper on which it was displayed. The smaller kinds will be sufficiently dry in forty-eight hours. A very little practice will make the process easy, and the trouble will be repaid by the beauty and interest of the collections which may soon be formed.

I have already mentioned some of the motives which have induced me to publish the present work. There is another, and certainly a strong one, which it would be improper here to omit. By connecting this work with the Herbarium of the University of Dublin, of which I have charge, my wish is to attract to our museum the attention of my countrymen, however distantly they may be placed, who retain a kindly feeling for the land of their birth, and its parent scientific institution. The museum of the University, which long remained in an inefficient state, is now, by the appointment of a Director and numerous Natural History professorships, and by the acquisition of large collections in zoology and botany, become of considerable importance, and will ere long, form one of the most complete museums of natural history connected with public teaching in the Empire. To increase the value of the botanical portion, which is more immediately under my care, is not only my duty, but one of my greatest pleasures. With this view I propose to publish, at intervals, memoirs, accompanied by plates, on those portions of the Botanical museum, which most need illustration; and as the Algæ have hitherto received much less attention than they deserve, I commence the series with them. Should the sale of the present volume sufficiently remunerate the cost of publication, it will probably be followed by a 'Nereis Tropica' and 'Nereis Borealis' on a similar plan, the whole forming a compendious picture of the vegetation of the ocean; while each volume will be complete as an illustration of the zone it describes. Specimens of Algæ and Corallines, from all parts of the world as materials for these volumes, are most earnestly desired; and collectors who favour the museum with contributions of this sort, may be assured that their donations will be fully and gratefully acknowledged, and the novelties which the collections contain speedily published; while, by placing the result of their labours in a public museum, the donors will have the satisfaction of knowing that their exertions will be permanently available for the purposes of science.

In the body of the work, I have stated under each plant, the source from which the specimens were derived, but I should be wanting in gratitude did I omit to record my thanks, in a more special manner, to several distinguished individuals whose contributions have been particularly valuable. To Sir William Jackson Hooker I am indebted, not merely for three fourths of the plants here described, but for almost all the little knowledge I possess of Exotic Algæ. Whatever Algæ his vast Herbarium contains, have been freely placed before me, and whereever duplicates could be spared they have been generously given. In this acknowledgement Dr. Joseph D. Hooker is included, the Antarctic Algæ due to his exertions, and of which I have received specimens, being incorporated with the Hookerian Herbarium. To Dr. Greville, Dr. Lemann, and Mr. John Gould, I am severally indebted for the examination of interesting parcels of Australian Algæ; and to Senator Binder, of Hamburgh, for a valuable series of most of the species collected by Preiss, at the Swan River Colony. In *Corallineæ* the University Herbarium is extremely deficient, but this want has been in great measure supplied by the liberality of four distinguished naturalists. To James Scott Bowerbank, Esq., I am under especial obligations for having entrusted to my care, for examination, the whole of the species of this beautiful family which his museum contains; nor less to Charles Darwin, Esq., for the liberal donation to our Herbarium of all those which he collected while accompanying H.M.S. 'Beagle' in her voyage round the world, and for liberty to make the freest use of his manuscript notes respecting them. And last, not least, my thanks are due to my friends Nathaniel B. Ward, Esq., and Professor Edward Forbes, for many beautiful specimens of Australian Corallines, some of which I have not received from any other source.

Trinity College, Dublin,
May, 24th, 1847.

LONDON:
REEVE, BROTHERS, KING WILLIAM STREET, STRAND.

NEREIS AUSTRALIS,

OR

ALGÆ OF THE SOUTHERN OCEAN.

LINNÆUS, and afterwards Jussieu, comprised under the common term ALGÆ, two closely allied and very extensive classes of Cryptogamic vegetables, the *Sea-weeds*, or submerged Algæ, and the *Lichens*, or aerial. The more accurate observation of these simple plants in modern times, has led to the separation of the Lichens into a distinct class, in some respects collateral with the submerged Algæ, but, however degraded in its lower members, probably entitled to a higher rank in the scale of organic being than its more showy rival. The humblest individuals of the Lichen races do indeed appear among the first vegetable organisms which are developed on the surfaces of naked rocks, on which, in their alternate growth and decay, they form the earliest obvious deposit of a vegetable soil. They doubtless precede the *Fungi* in their attacks upon the living tissue of higher vegetables, and thus would seem to hold the very lowest place in the scale of creation. But the eternal snows of high mountains, far beyond the limits even of Lichens, are the "nurse and mother" of the simplest Algæ, by the decay of whose fronds, perhaps, the invisible detritus, being carried down with the melting snow, a vegetable soil is afforded to the very Lichens which seem to occupy the first place in existence. Whether the *Protococcus* of the snow be entitled to its name, or whether it be in like manner dependent on an earlier organism, we cannot tell; but, with our present knowledge, it appears to be the simplest of all vegetables; and yet, from its microscopic minuteness we can trace upwards, in an unbroken chain of affinity, a series of analogous structures, gradually becoming more complex, which connect it in close relationship with the great Algæ of the Southern Ocean, one of whose enormous fronds is more than sufficient load for a man. The *Protococcus*, indeed, bears a close resemblance in structure and appearance to the spore of one of the larger Algæ, and a hasty observer might imagine that it was really nothing else than a spore arrested in its progress by the ungenial soil and climate which surround it, and that, in favourable situations, it might gradually advance to a higher organization. But such does not appear to be the case, for though this plant was first discovered on the snow of the Alps, and afterwards observed in similar situations on the Andes, and within the Polar Circle, yet it is by no means confined to the snow: it occurs on rocks down nearly to the level of the sea, in a great variety of climates: and yet preserves, throughout this great discrepancy of "modifying causes", an identity of structure; being neither more nor less complex. It is excessively common throughout Europe, on the surface of rocks (not exclusively on limestone, as has been asserted), wherever water frequently rests in depressions; and I have found it in similar situations at the Cape of Good Hope, in localities where snow never lies, and very rarely falls. Without presuming, therefore, to assert that the *Protococcus* admits of no higher development, we may be allowed to remark that our present knowledge of this humblest plant in nothing invalidates the fundamental law of organic nature,—that every living thing, plant or animal, has received at its creation, a certain charter of rights, within which it and its progeny may range, but which they may not pass. The theories of advancing development or transfusion of species, which have been so frequently started in modern times receive no confirmation in the case of the *Protococcus*; nor in any other instance in which the evidence has been carefully investigated.

When we compare the structure of the Lichens and Algæ, although, in the earlier forms of Lichens, the difference of development is scarcely appreciable, yet their higher races have organs of fructification much more elaborate than those of any Algæ. The presence in the Lichens of asci, or spore-cases of a peculiar structure, which are found also in a large number of *Fungi*, seem to establish the superiority of that class over the class of Algæ, in which the spore is much more simple. The close connection, too, of the Lichens with the *Fungi*, and the strong affinity which the latter have with the *Musci*, whose thecæ bear a close resemblance to many *Fungi*, appear to show that the chain runs more uninterruptedly through the Lichens to the more perfect plants, than through the Algæ, whose closest connexion seems to be with the lower members of the Animal Kingdom.

The *Characeæ*, which by many authors are placed among the Algæ, an arrangement sanctioned by Lindley, in his recent 'Vegetable Kingdom', have always appeared to me to be plants of a far higher organization, allied more closely to the *Marsileaceæ* than to any others. The chief reason for placing them among the Algæ, is the simple structure of their fronds, which are composed of cells, very similar to those of the *Confervæ* and *Vaucheriæ*. But their fructification is quite dissimilar from that of any Alga, and greatly more complex,—however little its details may be yet understood. This consideration ought, I think, to outweigh any mere outward resemblance between the organs of vegetation. Some of the *Podostemaceæ* have fronds closely resembling Algæ in appearance; and yet no one would remove them from the *Dicotyledones* on that account.

The *Diatomaceæ* are the only other Cryptogamic plants to which I need advert, as having a close affinity with the Algæ, and being, by most authors, considered members of the same class. This extensive group consists, for the greater part, of microscopic objects, a large number of which are encased in *silica*, which is often elegantly striated or sculptured; and but a small number comparatively, attain to the length of a few inches. This minuteness has, until the improvements in the microscope of late years, operated against their study, and caused their exact relations to be little known, and even their forms to be imperfectly described. But the brilliant discoveries of Ehrenberg and others, have recently attracted many students into this field; and observations upon them have been multiplied and become more exact. Still their position is undecided. Some authors consider that they belong to the Animal, some to the Vegetable Kingdom, and others adopt a mixed belief, referring some to the one, and some to the other. By Bory it was proposed to erect a third or Phytozoic Kingdom for their reception, so doubtful did their relations appear to him. The number of their genera and species is very considerable, while countless myriads of individuals exist throughout the Ocean, and in the running and stagnant waters of every country, and have been, at least, equally abundant from a very early period of the world's history, whole chains of mountains having been built up of their debris. So truly astonishing is the history of these atomic organisms; probably the earliest inhabiters of our planet. But whether we regard them as animals or plants, and their affinity with the Vegetable Kingdom is probably the stronger, I think I am safe in asserting, that the more attentively they are studied in all their bearings, the broader will the line of demarcation appear between them and the true Algæ; and that they properly constitute a class, intermediate between the Algæ and the Sponges, the lowest organized beings within the animal frontier. There is, indeed, often a striking resemblance between the spiculæ of Sponges, and the frustules of *Diatomaceæ*.

What I regard as Algæ *proper*, and propose to illustrate in the following pages, are those plants commonly known by the name of Sea-weeds, and some fresh-water species of a similar structure. By Linnæus they were classed under three genera, *Fucus*, *Conferva* and *Ulva*, and by modern authors they are usually placed under three groups,* though not parallel with the Linnæan genera. In the recent synopsis of Endlicher, these groups are proposed as Natural Orders, having the same systematic value as that term in botany usually expresses; and this arrangement is adopted in Lindley's 'Vegetable Kingdom'. To me it appears that they are assemblages of a much higher value, and probably to be regarded as alliances or sub-classes, the families into which each is divided being really orders. But as this question is yet undecided, I retain the old name 'SERIES' for the three great groups, and that of 'FAMILY' for the minor divisions. Each of the Series contains within it plants of a very great variety of structure, and is a group much more heterogeneous than any Natural Order among Phenogamous plants would be permitted to be; and there seems no good reason why this term should have a different meaning among Cellulars. No doubt the groups in question are natural; for they present considerable parallel relations between their families, the *Rhodomeleæ* being analogous to *Dictyoteæ*; *Delesserieæ* to *Fuceæ*; *Sphærococcoideæ* to *Laminarieæ* and *Ulvaceæ*; *Cryptonemeæ* to *Chordarieæ* and *Batrachospermeæ*; and *Ceramieæ* to *Ectocarpeæ* and *Conferveæ*.

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* Kutzing, however, has but two great classes, which he subdivides into ten orders, and seventy-seven families.

But however natural the Series, and easily distinguished by the practised eye, it is by no means easy to assign strict limits to them by written characters. The most obvious character is their colour, the *Rhodospermeæ* comprising all the red or red-brown sea-weeds; the *Melanospermeæ* all the olive-coloured; and the *Chlorospermeæ* those of a grass-green. There are exceptional cases, however; a very few of the *Chlorospermeæ* being of a violet colour, and some of the *Rhodospermeæ* sometimes assuming a greenish tint. These, though very puzzling to the contriver of systems, are easily mastered by the student, who very soon learns to know by the habit of a plant what its affinities probably are. Of course, when we speak of colour as a guide to the student, the primitive colour of the growing plant is meant, not that which it assumes when dry or in decay; exposure to the air, and bleaching in the sunshine destroys, in greater or less degree, the characteristic colour of most, frequently converting the olives, and some reds, to black, and most other reds, through various tints of orange and green, into white. There are, of course, other and more important distinctions to be attended to, derived from differences in the organs of fructification, which will be found in the synopsis following. I merely speak of colour as affording an obvious clue to affinity.

The organs of fructification in the Algæ are, perhaps, not yet fully understood. The *Rhodosperms* are remarkable for possessing what seems to be a double system of fructification, a thing without parallel in the Vegetable Kingdom. Certain it is that almost every species of this extensive group produces, but always on separate individuals, organs very different in appearance, each of which contains spores. The exceptions, on which a double fruit has not yet been found, are very few; and it can scarcely be doubted that future observation will detect it on these also. Experiments have been made with spores of both kinds, and both have been found fertile, reproducing the species. One of these descriptions of fruit, that which contains tetraspores, or spores which at maturity separate into four parts or sporules, occurs in all the *Rhodosperms*, offering modifications in structure of a very minor kind; and this has probably the claim to be considered the primary, or normal fructification of the group. The other, or conceptacular fruit, contains simple spores, tufted or densely compacted together, and is usually much more conspicuous than the tetrasporic fruit, the conceptacles being external, and when abundant, affecting the outward character of the plant very strikingly. This modification of fruit is by M. Decaisne regarded as abnormal, analogous to the spurious fructification of *Lichens* and *Hepaticæ*, or to the bulbs which are often found in the axils of the leaves, or of the floral organs of *Allium*, and which, equally with seeds, reproduce the species; but which no one regards on that account, as meriting the name of fructification. There is certainly much show of reason in this view of the case. Yet it appears scarcely credible that through the length and breadth of such a vast assemblage as the *Rhodosperms*, abnormal fructification should be produced with perfect regularity, and in the instance of nearly every species. That there should never be found a plant which produced partly one kind, and partly another; and that *ceramidia* should be the abnormal form in one group, *coccidia* in another, *favellidia* in a third. If the *favellæ* be "un etat anormal des sphérospores (*tetraspores*), et les coccidies le resultat d'une sorte de concentration du tissu de la fronde qui donne lieu à des productions tres diverses, et entrave, dans certains cas, plus ou moins complétement, la production des sphérospores"; why are either never found in the *Rhodomeleæ*? in which family the conceptacular fruit takes the very distinct form of *ceramidia*? or why should not *coccidia* and *favellæ* be found on the same plant? There is still much that we do not comprehend in the fructification of these plants, and it appears to me to be rather getting rid of a difficulty, than explaining it, to deny normal functions to the conceptacular fruit, which is too constantly formed and too regularly organised to be the result of sportive or diseased growth.

In the *Melanospermeæ* two organs, connected with fructification, have also been observed, one of which appears, in the form of undoubted spores, which are either simple, or divided at maturity into two, four, or eight parts, each of which is capable of reproducing the species. The other, to which the name *antheridium* is applied, has been observed in the *Fuceæ* and some *Dictyoteæ*, and consists of membranous cases filled with minute corpuscules, which, on their liberation in fluid, swim about, by means of cilia, with extraordinary vivacity; and to these the office of pollen has been attributed. These curious bodies are, in the *Fuceæ*, contained within conceptacles similar to those which produce spores, but instead of being attached to the walls of the conceptacle, as the spores are, they are seated on the branches of tufted filaments. Some species are *monœcious*, some *diœcious*, so to speak; but it does not appear that the same species is occasionally one or other. *Antheridia*, in many respects similar, are found in several *Rhodospermeæ*, particularly among the *Rhodomeleæ*. They are always of a yellow or orange colour, whether observed as *Melano-*

sperms or *Rhodosperms*; and whatever their office may be, they are doubtless normal productions.

The fructification of the *Chlorosperms* is, like their whole structure, much more simple and is dispersed throughout all the cellules of the frond; but here again, in certain families, and possibly in all, we have separate organs, analogous to the conceptacular fruit of the *Rhodosperms*, called *Coniocystæ*, which contain a highly organized sporular mass, and sometimes, as in the curious southern genus *Mastodia*, produce tetraspores! The ordinary spore in the *Chlorosperms* is, like the corpuscules of the antheridium in the *Melanosperms*, furnished with cilia, and exhibits, on its first emission, vivid motions which closely resemble the motions of animal life. Here, doubtless, we are near the confines of vegetable and animal existence even though the *Diatomaceæ* intervene, and it is natural to expect a blending of the attributes of one or other kingdom. But that there should be any organism which is at one period of its existence animal, and at another vegetable, (which has been asserted of some of the *Chlorosperms*), is not probable, and does not appear consonant with reason. The instances of voluntary movement, which have been brought forward in favour of this notion, are capable of another and less violent explanation, and probably, after all, not more puzzling than the movements observed among higher vegetables, and the "voluntary" selections of proper food or situation which they make. With our finite faculties it is but rational to expect that there should be, among the infinite works of creation, points of approximation between great groups, such as the Animal and Vegetable Kingdoms, which are not really points of contact, though to our imperfect senses they may appear so; but we should be most rash, were we on that account to assert, that there is no absolute difference between animal and vegetable life.

SYNOPSIS

FAMILIARUM v. ORDINUM.

SERIES I.—RHODOSPERMEÆ, seu FLORIDEÆ. *Frondes* roseæ vel purpurascentes, raro badiæ v. rufo-viridescentes. *Fructus* duplex, dioicus, semper in diversis individuis evolutus, 1; *Conceptacula* sæpissime externa, intra pericarpium membranaceo-cellulosum, *sporas* indivisas fasciculatas vel arcte conglobatas foventia. 2. *Tetrasporæ* (vel *sporæ* perisporio hyalino gelatinoso-membranaceo donatæ, maturitate in sporulis quatuor divisæ) roseæ, externæ v. sæpissime immersæ, per frondem sparsæ, vel in receptaculis propriis lanceolatis v. foliiformibus collectæ, sæpe in soris dispositæ, rarissime fasciculatæ. *Marinæ.*

Fam. 1.—RHODOMELEÆ. *Frons* cellulosa, areolata aut articulata. *Ceramidia* externa. *Tetrasporæ* seriatæ, inclusæ. *J. Ag.*

Fam. 2.—CHONDRIEÆ. *Frons* cellulosa, continua (v. spurie articulata). *Ceramidia* externa. *Tetrasporæ* in ramulis inclusæ, sparsæ. *J. Ag.*

Fam. 3.—CORALLINEÆ. *Frons* sæpissime articulata, calcarea, rigida. *Ceramidia* externa.

Fam. 4.—DELESSERIEÆ. *Frons* cellulosa, continua, (areolata). *Coccidia* externa. *Tetrasporæ* in soris definitis aut sporophyllis propriis collectæ.

Fam. 5.—SPHÆROCOCCOIDEÆ. *Frons* cellulosa, continua, (cellulis corticalibus minutis). *Coccidia* externa. *Tetrasporæ* sparsæ, inclusæ.

Fam. 6.—CRYPTONEMEÆ. *Frons* fibroso-cellulosa. *Favellidia* subimmersa. *Tetrasporæ* inclusæ. *J. Ag.*

Fam. 7.—CERAMIEÆ. *Frons* tubuloso-articulata. *Favellæ* nudæ. *Tetrasporæ* subexternæ. *J. Ag.*

SERIES II.—MELANOSPERMEÆ seu FUCOIDEÆ. *Frondes* olivaceæ, siccitate sæpius nigrescentes. *Fructus* monoicus aut dioicus, vix vere duplex. *Sporæ* olivaceæ, perisporio hyalino donatæ, externæ, sparsæ v. intra conceptacula dispositæ, sæpius sessiles, maturitate sæpissime in sporulis 2, 4 v. 8 solutæ. *Antheridia* hyalina, corpusculis vividissimis repleta. *Marinæ.*

Fam. 8.—ECTOCARPEÆ. *Frons* filiformis, articulata. *Sporæ* externæ, solitariæ.

Fam. 9.—CHORDARIEÆ. *Frons* fibroso-cellulosa (e filis articulatis verticalibus horizontalibusque conflata), cartilagineo-gelatinosa. *Sporæ* inclusæ.

Fam. 10.—FUCEÆ. *Frons* coriacea, ramosa, sæpe foliifera. *Sporæ* in conceptaculis immersis sphæricis cavis inclusæ.

Fam. 11.—LAMINARIEÆ. *Frons* coriacea, expansa; cellulis corticalibus minutis. *Sporæ* verticales, in soris superficialibus densissime stipati.

Fam. 12.—SPOROCHNOIDEÆ. *Frons* cartilaginea, continua. *Sporæ* ad fila articulata penicillata v. in receptaculum capituliforme coacta, affixæ.

Fam. 13.—DICTYOTEÆ. *Frons* membranacea, areolata. *Sporæ* superficiales, sparsæ, v. in soris collectæ.

SERIES III.—CHLOROSPERMEÆ seu ZOOSPERMEÆ. *Frondes* virides, raro purpurascentes. *Sporæ* virides, raro violaceæ, sæpe quaternæ, "denique motu vivacissimo præditæ", intra cellulas singulas totius frondis formatæ. *Coniocystæ* (in omnibus?), vel vesiculæ externæ intra perisporium hyalinum granula chlorophylli numerosa in sporam (?) coalita foventes. *Marinæ*, v. *aquæ dulcis* incolæ.

Fam. 14.—SIPHONEÆ. *Cellulæ* filiformes, simplices v. sæpissime ramosæ, varie connexæ; nunc unica frondem monosiphoniam constans; nunc plures juxtapositæ, intertextæ et anastomosantes, frondes majores, sæpe calcareo-incrustatas, formantes.

Fam. 15.—BATRACHOSPERMEÆ. *Cellulæ* parvæ in fila ramosa gelatinosa connexæ. *Frons* polysiphonia, e filis longitudinalibus arcte compactis et horizontalibus sæpe moniliformibus verticillatis composita, nunc calcareo-incrustata.

Fam. 16.—CONFERVEÆ. *Cellulæ* cylindraceæ, truncatæ, in fila articulata simplicia, ramosa v. anastomosantia connexæ. *Fila* libera, v. plura in frondem gelatinosam compacta.

Fam. 17.—OSCILLATORIEÆ. *Cellulæ* filiformes, longissimæ, simplices, nudæ, v. muco indutæ, v. in frondem compactæ. *Endochroma* annulatum.

Fam. 18.—ULVACEÆ. *Cellulæ* polyhedræ, in frondem membranaceam, planam v. tubulosam coalitæ.

Fam. 19.—NOSTOCHEÆ. *Cellulæ* ellipticæ v. globosæ, in fila moniliformia gelatinosa connexæ. *Fila* libera, v. in frondes compacta.

Fam. 20.—PALMELLEÆ. *Cellulæ* ellipticæ v. globosæ, discretæ, sæpe quaternæ, v. singulatim per stratum gelatinosum dispersæ.

SERIES 1.—RHODOSPERMEÆ.

FAM. 1.—RHODOMELEÆ, *J. Ag.*

RHODOMELEÆ, *J. Ag. in Linn.* vol. XV. p. 23. *Alg. Medit.* p. 116. *Endlicher, Gen. Pl. 3rd Suppl.* p. 44. *Montagne, Algiers,* p. 75. RYTIPHLÆÆ, *Dne. Class.* p. 62. CERAMIEÆ (partim), *Dne. l. c.* THAMNOPHOREÆ (partim), *Dne. l. c.* ANOMALOPHYLLEÆ, *Dne.* CHONDRIEÆ (partim), *Dne. l. c.* DASYEÆ, POLYSIPHONIEÆ, CHONDRIEÆ (partim), BOTRYOCARPEÆ (partim), AMANSIEÆ, RYTIPHLÆACEÆ, CARPOBLEPHARIDEÆ (partim), CLAUDIEÆ, *Kütz. Phyc. Gen.* pp. 414–451.

Frons vel foliacea areolata, vel filiformis sæpe articulata, rarius opaca, è cellulis polygonis pluriseriatis sæpissime regulariter ordinatis conflata. *Cellulæ periphericæ* sæpius applanatæ, nunquam in fila horizontalia connexæ. *Fructus* duplex; 1, *Conceptacula* externa (*Ceramidia* dicta), ovata, v. urceolata, intra pericarpium membranaceo-cellulosum, apice pertusum, fasciculum sporarum pyriformium ad placentam centralem basilarem affixarum, continentia. 2, *Tetrasporæ* in ramulis sæpe transformatis, vel in receptaculis propriis lanceolatis (*Stichidiis*) inclusæ, simplici, duplici aut multiplici serie dispositæ, sæpissime triangule quadripartitæ.

My views respecting the limits of this Family are very similar to those proposed by Professor J. Agardh, in the memoirs above quoted; for, with the exception of *Dictyurus,* which I place in *Ceramieæ,* and *Martensia* (*Hemitrema,* R. Br.), which I refer to *Delesserieæ,* I admit all the genera which he has referred to it, nor do I propose to include within its compass any Agardhian genus, except *Polyphacum,* which he has placed in a different group. The short definition assigned to it by Agardh, "Frons cellulosa, areolata aut articulata: ceramidia externa: sphærosporæ seriatæ, inclusæ", is sufficiently distinct; and offers characters easily recognizable. The areolated-cellular frond distinguishes it from the *Cryptonemeæ,* in which the cellular tissue is arranged in filaments; while the form of fruit, called *ceramidium,* separates it from every other family, except the *Laurencieæ* (*Chondrieæ,* J. Ag.), and the *Corallineæ.* From the first of these the arrangement of the tetraspores in a definite manner, separate it: but the limits are not always of a very obvious character; from the second, the absence of any calcareous secretion and deposit, as well as a very different arrangement of cellular tissue, abundantly distinguish it. To my mind, no group within the *Florideæ* appears to be more clearly defined, or more truly a natural assemblage, and yet, the very large list of synonymes quoted above, from the systems of Decaisne and Kützing, shows that these authors entertain widely different notions. The system of Decaisne, however, comes much more near my arrangement than that of Kützing; for Decaisne has, in his *Rytiphlææ*, brought together the majority of the genera, and only erred, as I conceive, in giving too limited a character to his tribe, which embodies very nearly the *idea* of our *Rhodomeleæ*. The genera which he excludes may, I think, be easily shown to be more closely related to the *Rhodomeleæ* than to the plants with which he has associated them. They are *Dasya*, *Digenia*, *Polyphacum*, *Alsidium*, *Claudea*, and *Botryocarpa*: *Dasya* and *Digenia* he places in *Ceramieæ*. The fructification of the latter genus is imperfecty known, and therefore some doubt may be allowed to rest upon its true position; but the structure of its frond differs in many respects from that of other *Ceramieæ*, and agrees with that of undoubted *Rhodomeleæ*; coming near to that of *Rhodomela* in the stem, and of *Polysiphonia* in the ramuli; but it perhaps is most nearly allied to *Trigenia*, Sond., a genus discovered since M. Decaisne's memoir appeared. Respecting *Dasya*, I need hardly speak, for, as I trust the plates in this work will abundantly show, it is so closely allied to *Polysiphonia* both in structure and habit, that except for the more regularly formed stichidium, there is little of absolute character to distinguish these genera. The single-tubed ramuli will not suffice, for these are found in *Pol. byssoides* and *P. Cladostephus*. *Polyphacum* M. Decaisne constitutes as the type of a peculiar family, with fructification composed "de plusieurs rèceptacles (stichidies) oblongs, semblables à ceux des *Dictyomenia*, avec lesquels les Polyphacées offrent la plus grande ressemblance par leur structure anatomique ainsi que par leur coloration, qui tend à passer au brun foncé ou au noirâtre comme celle des *Polysiphonia*, *Rytiphlæa*", &c. These remarks apply solely to *Polyphacum*; for *Scaberia*, which M. Decaisne associated with it, he is now fully convinced is one of the *Fuceæ*, in which family it was originally placed by Greville. But *Polyphacum* offers no peculiarity of structure or fructification sufficient to constitute a separate family. *Alsidium*, M. Decaisne refers to his *Thamnophoreæ*; but the Agardhian genus of that name is scarcely distinct from *Polysiphonia*. *Claudea* he constitutes into a distinct family, distinguished by the conformation of the frond and the modified nature of the *stichidia*. While I admit that there are some grounds for this separation, if every gradation of structure be deemed sufficient to establish a new group,—still as I consider the difference in question to be merely a modification, I much prefer to leave *Claudea* among a set of plants to which it is allied by many characters, than to remove it from them and isolate it. The only remaining genus about whose position M. Decaisne differs with me in opinion, is *Botryocarpa*, which he places in *Chondrieæ*; and there are certainly some grounds for associating it with this group, chiefly on account of the muciferous cells with which the frond is filled, and because the tetraspores are indefinitely disposed in the stichidia. Notwithstanding this last discrepancy, yet as the tetraspores are contained in tufted stichidia, as in almost all the leafy *Rhodomeleæ*, and not scattered through the frond as in *Chondrieæ*; as the frond changes to black in drying, and, on the whole, has more the habit of a *Rhodomelea* than of any genuine *Chondrieæ*, I prefer associating it with the former. I have been thus far minute in enumerating the points in which I disagree with M. Decaisne's arrangement, because I value its many excellencies very highly, and feel grateful to him for much that is original in his researches on this subject, which he has carried through with his usual ability, and has chiefly erred where he has decided from imperfect materials. Professor Kützing's arrangement differs so completely from that which I have adopted, not only in his views of the family now under examination, but of every other, that I refrain from discussing its merits.

The *Rhodomeleæ*, as here defined, is one of the most beautiful among the families of the *Florideæ*, one of the most numerous in species, and dispersed over the globe nearly from the polar circles to the equator. They are marine, with the occasional exceptions of the European *Bostrychia scorpioides*, and the Antarctic *B. vaga*, which are sometimes found growing in brackish water, attached to the stems of phenogamous plants, though their more usual habitat is the estuaries of rivers, where, with some mixture of fresh water they are exposed to the flow of the tide. With these, and perhaps a few other exceptions, the *Rhodomeleæ* delight in the outer zones of marine vegetation, being most numerous on tidal coasts, about the limits of low water, and being found in most cases where they occur at a higher level, fringing the margins of deep rock-pools, left by the tide. To this preference there are some, but not many, exceptions in the genus *Polysiphonia*, some species of which (*P. fastigiata* e. g.) grow near high-water mark, and are left exposed for many hours every tide. Such species are, as might be expected, of a more rigid and tougher nature than others of the genus, and are usually of a very brown colour, in this respect nearly resembling the *Fuci* on which they grow; and such are, in general, very slowly acted upon by fresh water. Many, on the contrary, which are never left uncovered by the tide, are exceedingly impatient of fresh water, and will very rapidly decompose if placed in contact with it. But this is by no means constantly the case; for some of those that grow in the deepest water are very slowly acted upon. The gradation of colour, with the varying depth of water, is much more constant, those which grow at the greatest depth being of the brightest red; and this is observable in different individuals of the same species, produced under opposite circumstances.

A very obvious peculiarity of this family, is that which has given rise to the name of the typical genus, *Rhodomela* (derived from ροδεος, *red*, and μελας, *black*), namely, that very generally their colours change in drying from red to dark-brown or even black; and though this is by no means universal, or carried to an equal extent in species where some change occurs, yet it very frequently serves to point out affinity between plants, whose relations might otherwise be doubtful. A very striking instance of this change of colour occurs in the subject of our first plate (*Botryocarpa prolifera*), which, when fresh, is of a beautifully clear, pinky red; but which, if dried without much washing, changes to an intense black; and even when prepared, after having been allowed to remain in fresh water for several days, retains but a faint memory of its original colour. Similar change of colour, but in a lesser degree, occurs in *Pollexfenia*, the *Lenormandiæ*, the *Polyphaca*, and in many *Polysiphoniæ*, and very strikingly in *Rhodomela* and *Rytiphlæa*. Others, such as *Claudea*, *Amansia*, and many *Dasyæ*, preserve much of their original colours, except, of course, those iridescent hues which a few species exhibit while growing under water; but these are scarcely proper to the plants, belonging rather to the medium through which they are seen.

So little is yet known of the vegetation of the tropical ocean, that it is premature to speak, except in very general terms, of the relative distribution of marine forms, our data being far too imperfect for the purposes of a sound induction. It is highly probable that the *Rhodomeleæ* are numerous within the tropics, possibly, next to the *Cryptonemeæ*, the most numerous family of *Florideæ* in variety of species, though not in number of individuals, the social Corallines, like their analogues the Corals, probably far surpassing them, and every other family, in extent of surface covered; but comparatively few tropical *Rhodomeleæ* have yet been described. In the North Temperate zone the species are very numerous, and obviously increase in its warmer region, from about the latitude 37° to 34°, but by far the greater number belong to the extensive genus *Polysiphonia*, of which the shores of Europe supply, if the same plant be not called (as I fear is the case) by more than one name, no less than one hundred and fifty species; while the species of the nine other European genera of *Rhodomeleæ* amount to but twenty-one. The South Temperate zone offers a remarkable contrast, even with our present miserably imperfect knowledge of its marine vegetation, and no doubt, when more fully explored, the difference will be much more striking. In place of but ten genera, as in Europe, there are in the south no less than twenty-two, of which twelve are peculiar to the Southern Ocean, and these twelve are by far the most remarkable and strongly marked of the family; namely, *Claudea*, *Botryocarpa*, *Polyphacum*, *Lenormandia*, *Jeannerettia*, *Sarcomenia*, *Pollexfenia*, *Kützingia*, *Epineuron*, *Spyrhymenia*, *Trigenia* and *Polyzonia*. Of the ten European genera, eight are common to the south; and one of these, *Dasya*, reaches its maximum both of individual development and of specific variety in the Southern Ocean, where there are sixteen species (as yet known, but probably many more); while the closely explored shores of Europe produce but ten, and these, with two exceptions, species of small growth. *Odonthalia* has no direct southern analogue but has a general resemblance to *Epineuron* and *Spyrhymenia*. *Digenia*, the other European genus, which is common to the warmer latitudes of the Northern Atlantic, the Mediterranean and the Red Sea, and which occurs again at the Mauritius, very probably exists on the shores of Extra-tropical Australia, but I am not aware that it has yet been observed there. Eight of the remaining southern genera, namely, *Amansia*, *Dictymenia*, *Alsidium*, *Acanthophora*, *Polysiphonia*, *Dasya*, *Bostrychia*, and *Leveillia* are also tropical, and of these, *Amansia* and *Leveillia* do not extend into the North Temperate zone. Taking a general survey of the family, if we omit the genus *Polysiphonia,* which is dispersed from the shores of Arctic America and Asia, through the tropics and to Cape Horn, the preponderance is greatly in favour of the south; where the head quarters of this beautiful group apparently is.

CONSPECTUS
GENERUM RHODOMELEARUM.

* *Frons* retiformis, è phyllodiis pusillis anastomosantibus constructa.

I.—CLAUDEA.

* * *Frons* plana, prolifera.

II.—BOTRYOCARPA. *Frons* carnoso-cartilaginea, ecostata, lævis. *Stichidia* cæspitosa, sparsa.

III.—POLYPHACUM. *Frons* crassa, costata, spinulis asperata. *Stichidia* cæspitosa, apicem versus frondis posita vel sparsa.

IV.—LENORMANDIA. *Frons* membranacea, costata, decussatim striata. *Stichidia* sparsa.

V.—JEANNERETTIA. *Frons* membranacea, costa evanescenti percursa, striis curvatis è costâ ad marginem oblique proficientibus notata. *Stichidia* sparsa.

VI ?—SARCOMENIA. *Frons* carnosa, è disco prolifera, segmentis subcostatis. *Stichidia* sparsa.

(IX.—*Amansia*, vide infra.)

* * * *Frons* plana, lobata vel pinnatifida.

VII.—POLLEXFENIA. *Frons* ecostata, lobata v. laciniata. *Stichidia* (v. *sporophylla*) superficialia, sparsa.

VIII.—KÜTZINGIA. *Frons* costata, penninervis, areolata; areolis rectangulis. *Stichidia* cæspitosa, ad nervos transversos posita.

IX.—AMANSIA. *Frons* (raro *prolifera*!) costata, transversim zonata, areolata; areolis hexagonis. *Stichidia* marginalia.

X.—EPINEURON. *Frons* costata, transversim striata. *Stichidia* ad costam posita.

XI.—SPYRHYMENIA. *Frons* subecostata, transversim striata. *Stichidia* fasciculata, intramarginalia, è pagina superiore enata.

XII.—DICTYMENIA. *Frons* costata, areolata; areolis polygonis. *Stichidia* marginalia (è dentibus v. laciniis frondis formata).

* * * * *Frons* filiformis. *Ramuli* assimiles.

XIII.—ALSIDIUM. *Frons* inarticulata, laxe reticulata, cellulis polygonis corticata, superne crebre transversim striata. *Tetrasporæ* in stichidiis axillaribus v. terminalibus uni-biseriatæ.

XIV.—Rytiphlæa. *Frons* (sæpe compressa) inarticulata, opaca, cellulis minutis corticata, superne crebre transversim striata. *Tetrasporæ* in stichidiis propriis sparsis, v. in ramulis ultimis nidulantes.

XV.—Acanthophora. *Frons* inarticulata, opaca, cellulis minutis corticata; ramulis spinæformibus echinata. *Tetrasporæ* in stichidiis è ramulis formatis nidulantes.

XVI.—Rhodomela. *Frons* inarticulata, opaca, cellulis minutis corticata (*nec transversim striata*). *Tetrasporæ* in ramulis ultimis immutatis nidulantes, uniseriatæ.

XVII.—Trigenia. "*Frons* cartilaginea, continua, undique ramentis carnosis filiformibus simplicibus ramosisve obsessa." *Sond.*

XVIII.—Polysiphonia. *Frons* articulata v. inferne inarticulata plus minus opaca, v. reticulata. *Ramuli* semper articulati, articulis longitudinaliter striatis, geniculis hyalinis. *Tetrasporæ* in ramulis vix mutatis nidulantes, uniseriatæ.

XIX.—Dasya. *Frons* articulata v. inarticulata, cylindracea v. compressa, ramellos monosiphonios articulatos (sæpissime) fructiferos emittens. *Tetrasporæ* in stichidiis lanceolatis pedicellatis bi-multiseriatæ.

XX.—Bostrychia. *Frons* tubo articulato percursa, cellulis quadratis uni-v-pluriseriatis circumpositis tessellata, interstitiis pellucidis. *Tetrasporæ* in stichidiis terminalibus biseriatæ.

* * * * * *Frons* filiformis. *Ramuli* applanati, foliiformes.

XXI.—Polyzonia. *Ramuli* (*phyllodia*) inciso-dentati, haud involuti. *Stichidia* lanceolata, pedicellata.

XXII.—Leveillia. *Ramuli* (*phyllodia*) integerrimi, barbati, circinatim involuti. *Stichidia* sessilia, circinatim involuta.

GENUS 1. CLAUDEA, *Lamour.*

Frons prolifera. *Phyllodia* fenestratim retiformia, parallelè costata, è foliolis minutis triseriatim secundis uninerviis anastomosantibus constructa. *Ceramidia* ovato-globosa, ore obliquo, pedicellata (è foliolis primariis formata), fasciculum sporarum pyriformium continentia. *Stichidia* elliptica, applanata, inter costas phyllodiorum seriata (è foliolis secundariis formata), tetrasporas triangulè v. cruciatim divisas duplici v. quadruplici serie foventia. Alga *Australasiæ* speciosissima, amœne-rosea, caulescens, demum ramosissima; phyllodia falcata acinaciformia.

CLAUDEA elegans, *Lamour. in Ann. Mus.* vol. xx. p. 121. *Grev. Syn. Alg.* p. xlvi. *Endl. Syn.* p. 50. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 408. t. 20. ONEILLIA elegans, *Ag. Syst.* p. 253. FUCUS Claudei, *Turn.* t. 243.

HAB. On the coast of New Holland, *Péron.* On rocks at low-water mark, Port Effingham, mouth of the Tamar, Tasmania, *Ronald Gunn, Esq.* (1843) (*v. s. in Herb. Trin. Coll. Dub. com. Cl. Hooker.*)

Root fibrous? *Frond* finally 12–20 inches long, and much branched, consisting of a system of falcate phyllodia, having the construction of an open net-work, and growing proliferously one from the other. *Stem* cylindrical and cartilaginous, in young specimens simple and naked below; at a short distance above the base margined with a very narrow, delicately membranaceous, cellular wing, which is continued to the apex, curved like a scimitar. From the commencement of the wing to the apex, the outer side of the curved stem gives off, at distances of about a line apart, a series of very narrow, winged, nerved *leaflets*, from half an inch to an inch in length, exactly parallel to each other, and issuing at an angle of about 45° to the stem. These are connected together by transverse, nearly horizontal leaflets, which issue from the upper side of their nerve, and whose apices unite and anastomose with the opposing point of the under side of the nerve of the leaflet next above them; and these *secondary* leaflets are themselves connected by a tertiary series, which issue and anastomose in a similar manner. This is the structure of the *phyllodium*, which is linear and falcate in its outline; strengthened by a *costa* (being a continuation of the *stem*) along its concave margin, and spinoso-dentate along the convex. At uncertain points along the principal costa of the phyllodium, spring other phyllodia, of the same form, and constructed in the same manner. The main phyllodium is often from twelve to fourteen inches long, and one to two inches wide; the rest are of all sizes from half an inch to six inches. *Colour* a clear rose-red, which is preserved in drying. *Ceramidia* membranous, inflated, with an oblique orifice, containing a dense tuft of pyriform spores, borne at the tips of short secund pedicels, issuing from the lower part of the costa of a phyllodium; being in truth a metamorphosis of the primary leaflets. *Stichidia* formed by a metamorphosis of the *secondary* leaflets, sometimes alternating with normal leaflets (in which case the latter exhibit the usual *tertiary* series, which anastomose with the lower side of the stichidium), but more usually ranged in continuous series, elliptical, flattened, cellular, transversely striate, containing triangularly or cruciately parted tetraspores, disposed in transverse rows, about four in each row, but some frequently abortive. The structure of the frond is highly cellular and delicate; the cells large, irregularly polygonal.

This is by far the most remarkable Alga in its structure, and the most beautiful in its appearance, yet brought from the shores of Australia, rich as these are in attractive forms. Until Mr. Gunn re-discovered it in the station given above, but two specimens existed in European herbaria, and it was considered the rarest of all Algæ. It was originally found by Péron, but on what part of the coast of New Holland, has not been ascertained. Its exact range is therefore unknown.

The anastomosing net-like frond distinguishes it from all the other *Rhodomeleæ*, to which family it is, in its fructification and cellular structure, very closely related.

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GENUS 2. BOTRYOCARPA, *Grev.*

Frons prolifera. *Phyllodia* plana, carnoso-cartilaginea, enervia, indivisa, intus lacunis oblongis muco repletis alveata, è cellulis minutissimis pluriseriatis formata. *Ceramidia* cæspitosa, pedicellata, per totam frondem sparsa, plano-convexa, ore conico minuto, fasciculum sporarum pyriformium continentia. *Stichidia*, v. *sporophylla*, cæspitosa, pedicellata, sparsa, orbicularia, tetrasporas pusillas triangulè divisas vagas foventia. Alga *Capensis*, rosea, siccitate nigrescens, habitu *Iridææ* referens.

BOTRYOCARPA prolifera, *Grev. Syn.* p. xlix. *Endl. Syn.* p. 47. *Harv. Gen. S. A. Pl.* p. 400. DELESSERIA botryocarpa, *Lamour. Ag. Syst.* p. 253. FUCUS botryocarpus, *Turn.* t. 946. (TAB. I.)

HAB. On submarine rocks. Cape of Good Hope, *Horneman*. Not uncommon at Sea Point, near Cape Town, *W. H. H.* (*v. v., et s. Herb. T. C. D.*)

Root branching. *Stem* cartilaginous, as thick as small whip-cord, slightly branched, the branches expanding into obovate, obtuse phyllodia, tapering at the base, from six to eight inches in length, and two to four inches wide, undivided, but frequently injured and appearing laciniated; producing, generally from some injured part, secondary phyllodia, in all respects similar to the primary. *Substance* thick, shrinking much in drying. *Colour* when recent, a bright pink, but becoming darker on exposure to the air, and at length intensely black. *Fruit*, of both kinds, tufted, pedicellate, scattered over the frond; *ceramidia* plano-depressed, with a prominent aperture, orbicular; *stichidia* orbicular, with scattered spores. The substance of the frond is traversed by hollow chambers, filled with transparent mucus, oblong, straight or curved, longitudinal, pointed at each end, but very irregular in form and size. These chambers, seen through the cells of the surface, cause the frond to appear areolated under a lens of low power.

Tab. 1. BOTRYOCARPA PROLIFERA. Fig. 1. A frond:—*of the natural size*. 2. Transverse section:—*highly magnified*. 3. Portion of the external surface:—*slightly magnified*, showing the pseudo-areolations. 4. Minute portion of the same:—*highly magnified*, showing the surface cellules. 5. Tuft of stichidia. 6. Tetraspores from the same. 7. Tuft of ceramidia. 8. Spores from same.

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GENUS 3. POLYPHACUM, *Ag.*

Frons prolifera. *Phyllodia* plana crassa costata, ramentis verrucosis v. spinæformibus utrinque asperata, è cellulis *interioribus* maximis pluriseriatis, *exterioribus* minutis angulatis formata. *Ceramidia* ignota. *Stichidia* cæspitosa pedicellata lanceolata apice involuta, apicem versus frondis posita sparsave, tetrasporas triangule divisas duplici serie foventia. Algæ *Australasicæ*, scaberrimæ, siccitate rigidæ, nigricantes. *Phyllodia* anguste linearia, repetitim prolifera.

1. POLYPHACUM proliferum, *Ag.*, phyllodiis anguste linearibus basi cuneatis obtusis, verrucis pusillis stipitatis spinulosis densissimè velatis, spinulis articulatis, stichidiis apicem versus frondis cæspitosis. *Ag. Syst.* p. 274. *Grev. Syn.* p. xxxvi. *Endl. Syn.* p. 33. *Sonder, Bot. Zeit.* 1845. p. 54.

OSMUNDARIA prolifera, *Lamour. Ess.* t. 1. *Decaisne, Voy. Venus, ined.* (*cum icone eximia*).

HAB. On the coast of New Holland, *Lamouroux*. Swan River, *Preiss* ! (*v. s. in Herb. T. C. D., com. cl. Binder !*)

Stem two to three inches long, two to three lines in diameter, cartilaginous or somewhat woody, compressed, giving off a few proliferous, similar branches, from whose flat sides spring linear, narrow phyllodia, four to six inches long, and a quarter of an inch broad, traversed by a midrib, from various points of which spring similar phyllodia. Every portion of both surfaces is thickly clothed with minute, pedicellate, wart-like, spiny ramenta, which completely conceal the surface of the frond, and give it a harsh, rough feel. The spines of these ramenta are joined like the ramuli of a *Polysiphonia*. *Stichidia* forming dense clusters, at or near the apices of the phyllodia, linear-lanceolate, involute, pedicellate, containing a double row of tetraspores. *Colour*, when dry, very dark brown, with a reddish tinge, probably brown-red when recent.

The affinities of this plant were misunderstood by Agardh, who placed it among the *Fuceæ*, from which Decaisne has, with great propriety, removed it, and pointed out its true relations, which are with *Dictymenia* and its allies. *Polyphacum dichotomum*, J. Ag., in Linnæa, xv. p. 3, has a very different structure, and has been made the type of a genus called *Thamnoclonium*, by Kützing, belonging to the *Sphærococcoideæ*.

2. POLYPHACUM Smithiæ, *Hook. fil. et Harv.*; phyllodiis anguste linearibus basi cuneatis obtusissimis, subemarginatisve, ramentis lanceolatis simpliciusculis minutis obsitis, stichidiis solitariis pedicellatis corymboso-multipartitis secus marginem frondis ordinatis.

LENORMANDIA (?) linearifolia, *Harv. in Herb. olim.* (TAB. III.)

HAB. At Circular Head, Tasmania, *Mrs. Smith* and *R. Gunn, Esq.* (*v. s. in Herb. T. C. D. com. cl. Hooker !*)

Frond originating in a narrow, undivided, primary leaf, four to six inches long, and scarcely a quarter of an inch in breadth, of a membranaceous or subcoriaceous, thickish substance, tough and not adhering to paper, tapering to the base, but very blunt and sub-

emarginate at the apex, traversed by an internal rib, and having its surface on both sides, densely asperated with minute, lanceolate ramenta, a line or less in length, with involute tips. This primary leaf throws off, from various parts of its midrib, leaves similar to itself, two to four inches long, and two to three lines wide, clothed in like manner with ramenta; and these also produce other phyllodia. In old specimens the primary leaf is converted into a stout, winged, woody stem; and many of the ramenta are more or less compound. *Stichidia* compound, scattered along the disc of the phyllodium, generally near the margin, pedicellate, very much branched in a corymbose manner, the corymb with three or four primary branches each of which produces several distichous, secondary stichidia, strongly involute or circinate, containing a double row of tetraspores, and bearing other proliferous, minute stichidia from their inner faces. *Colour*, when dry, reddish brown.

This has so much the habit of the preceding, that, though its fructification is somewhat different, I am induced to place it in this genus, although I formerly referred it to *Lenormandia*, to which, in some respects it is also allied. The structure of the frond is very similar to that of *P. proliferum*, from which the very different character of the ramenta abundantly distinguish it. I regret that the true stichidia are not represented in the plate; the specimen from which it was drawn not having been in fruit.

Tab. 3. POLYPHACUM SMITHIÆ. Fig. 1. A frond:—*of the natural size.* 2. Ramenta, producing tetraspores? 3. Apex of a phyllodium. 4. Transverse section of a phyllodium:—*all more or less magnified.*

GENUS 4. LENORMANDIA, *Sond.**

Frons prolifera. *Phyllodia* plana, membranacea, costata, decussatim lineata, lacunis internis rhombeis in zonas ordinatis alveata. *Cellulæ* externæ minutæ. *Ceramidia* "ovata, granulis clavatis fœta." *Stichidia* lanceolata, per totam frondem sparsa, tetrasporas biseriatas foventia. Algæ *Australasicæ* speciosæ, foliaceæ, siccitate badiæ; phyllodiis pellucidis, è disco v. margine proliferis.

1. LENORMANDIA spectabilis, *Sond.*; phyllodiis tenui-membranaceis lineari-obovatis, obtusis subcrenulatis è disco proliferis, margine incrassato, nervo tenuissimo, stichidiis densissime sparsis. *Sond. in Bond. Zeit.* 1845, p. 54.

HAB. Swan River Colony, *Preiss*! *Mylne*, no. 15 (*v. s. in Herb. T. C. D. com. cl. Binder*).

Primary leaf four to six inches long, about an inch wide near the apex, obtuse, tapering to the base, narrow obovate, or cuneate, traversed by a very slender, not always obvious, midrib, marked with decussating lines, which produce the appearance of diamond-shaped areolations on the surface. Margin thickened, either entire or very obscurely crenulate. From either surface of the lamina spring similar phyllodia, which produce others in like manner. The whole of the surface is muricated with scattered stichidia, which are frequently abortive and converted into rough points. Those that arrive at perfection are lanceolate, and contain a double row of tetraspores. *Colour*, probably a purple-red; when dry, brownish.

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* Sonder in Bot. Zeit. 1845; not of Montagne, which is *Thysanocladia*, Endl.

2. **Lenormandia** latifolia, *Harv. and Grev.*; phyllodiis crassiusculis lato-obovatis obtusis integerrimis, margine incrassato, nervo obsoleto, stichidiis fasciculatis, fasciculis per frondem sparsis.

Hab. Swan River Colony, *Mylne*, no. 6 (*v. s. in Herb. cel. Lemann*).

Of this I have only seen a single phyllodium, which is nine and a half inches long, and two and a half inches wide at its broadest part, of a thicker substance than *L. spectabilis*, destitute of secondary phyllodia, and seemingly nerveless; but this last character may be owing to imperfect preservation. The whole surface is densely muricated with minute clusters of stichidia, some of which are abortive, and spine-like, the rest lanceolate. *Colour* when dry, brownish-red. *Substance* cartilagineo-membranaceous.

Possibly this may be only a very luxuriant state of the last species, a point which cannot be determined without seeing more numerous and perfect specimens. Its great size, and especially its simplicity, distinguish it from any specimens of *L. spectabilis* which I have seen; but I am ignorant how far that species may vary.

3. **Lenormandia** marginata, *Hook. fil. et Harv.*; phyllodiis tenui-membranaceis lato-lineari-oblongis obtusissimis subemarginatis ciliatis, è margine limboque proliferis, stichidiis marginalibus sparsisque, nervo tenui. (Tab. II.)

Hab. Mouth of the Tamar, Tasmania, *R. Gunn, Esq.* (*v.s. in Herb. T. C. D., com. cl. Hooker*).

Frond originating in a linear oblong undivided primary leaf, three to six inches in length, from half an inch to three quarters in breadth, rounded and but slightly narrower at the base, having parallel sides, and very obtuse or slightly notched at the apex, traversed by a slender midrib, unaccompanied by lateral veins, delicately membranaceous, and, as seen under a pocket lens, marked with a double set of oblique striæ, crossing each other and dividing the surface of the frond into rhomboidal areolæ. This primary phyllodium is ciliated from a short distance above its base to its apex, with minute, lanceolate processes about half a line in length, some of which are converted into *stichidia*, others into phyllodia precisely resembling the primary one, and producing from their margins a third, fourth or fifth series, until there results a very compound frond, formed of oblong leaf-like pieces growing one from the other. In old specimens the membrane of the primary leaf is much contracted and torn, and the midrib, which in younger leaves is scarcely more than a line, is strengthened into a stout stem. Now and then, but not frequently, the new leaves spring from the disc of the older. *Stichidia* lanceolate, obtuse, fringing the margin of the whole frond, and also scattered, in greater or less abundance, over its surface, usually solitary, occasionally two or three in a tuft, containing a double row of tetraspores. Surface cells minute, hexagonal. Central rhomboidal cells or lacunæ in a single stratum. *Colour*, when dry, pale brown. probably purplish or brownish red when recent.

Tab. 2. Lenormandia marginata. Fig. 1. A frond:—*of the natural size*. 2. Apex of a phyllodium. 3. Minute portion of the same, showing the surface cellules and the rhomboidal pseudo-areolations. 4. A transverse section of the frond, showing its internal structure. 5. A stichidium. 6. Tetraspores.

GENUS 5. JEANNERETTIA, *Hook. fil. et Harv.*

Frons prolifera. *Phyllodia* plana membranacea costa evanescenti percursa, striis curvatis è costa ad marginem obliquè proficientibus notata, è cellulis quadratis coloratis formata. *Ceramidia* ignota. *Stichidia* lanceolata fasciculata per totam frondem dispersa, tetrasporas duplici serie foventia. Alga *Australasica*, speciosa, purpurea, foliacea, phyllodiis lobatis.

This new genus is dedicated by Dr. Hooker and myself, to Dr. Jeannerett, of Tasmania, from whom we have received a number of interesting Algæ, gathered at Port Arthur, and among them the first specimens we had seen of this remarkable plant. In its general habit there is a considerable resemblance to *Delesseria platycarpa*, but the nature of the fructification is very different; and it is, in truth, more nearly allied to *Pollexfenia*, from which it chiefly differs in having a distinct costa, and in being proliferous.

JEANNERETTIA lobata, *Hook. fil. et Harv. MSS.* (TAB. IV.)

HAB. At Port Arthur, Tasmania, *Dr. Jeannerett*. Also collected by the *Rev. Mr. Ewing*. (*v. s. in Herb. T. C. D. com. cl. Hooker* !)

Frond perennial, eventually of large size, probably one or two feet long, but our specimens are very imperfect, formed in a proliferous manner of nerved phyllodia, the new springing from the midribs of the old. *Primary* leaves, in old specimens, lose their lamina and are converted into tough, strong, compressed, or more or less winged stems, six to eight inches long, or more, giving off, along their extent, secondary phyllodia with more or less of membrane adhering to them. From the primary and secondary leaves thus altered into stems, spring, without order, except that they invariably issue from the midrib, the young phyllodia which we shall now describe. In our most perfect specimen these are from two to four inches long, and from half to three quarters of an inch wide, oblong, undivided or forked, having a few lateral, alternate, rounded lobes, a very undulating margin, and furnished with a strong, thick midrib, which gradually fails towards the apex, and vanishes altogether at a short distance from the point. This rib throughout its length is covered with foliaceous processes, the preparation probably, for phyllodia of the next season. Our specimens are too imperfect to warrant us in limiting the variations in form of the perfect phyllodium, which are probably considerable. The lobes, for example, may lengthen, acquire midribs, and be themselves lobed, of which propensity we think we see indications in one specimen. The whole leaf is traversed by close, parallel, internal striæ, very visible under a pocket lens, which originate in the midrib, and proceed in a very oblique line towards the margin. These are formed by internal, articulated filaments, which pass through the substance of the lamina, which is formed of a double layer of quadrate, coloured cells. *Substance* rigid, not adhering to paper. *Stichidia* in bunches, scattered over the surface of the phyllodia. *Colour* probably a clear purple-lake, brownish when dry.

Tab. 4. JEANNERETTIA LOBATA. Fig. 1. A frond—*of the natural size*. 2. Apex of a phyllodium, showing the vanishing costa, and the curved striæ. 3. Transverse section of the frond, showing the internal structure. 4. Portion of the surface, showing its cellular structure, traversed by pellucid striæ. 5. Tufts of stichidia. 6. Stichidia, separated. 7. A tetraspore.

GENUS 6. SARCOMENIA, *Sond.*

"*Frons* plana carnosa, è disco prolifera, segmentis stipitatis, subcostatis. *Fructus* per discum frondis sparsi; *stichidia* oblonga pedicellata duplici serie sphærosporas foventia; *ceramidia* globosa subpedicellata granula subpyriformia includentia. *Alga* marina, sanguinea." *Sond.*

SARCOMENIA Delesserioides, *Sond. in Bot. Zeit.*, 1845. p. 56.

HAB. Swan River Colony, *Preiss.*

I am unacquainted with this plant, and doubtful whether it properly belongs to *Rhodomeleæ*. It is placed in *Delesserieæ* by Sonder, but the description given of its fruit does not accord with the character of that family.

Among a collection of Swan River Algæ, made by Mr. Mylne, and now in possession of Dr. Lemann, I find a specimen (no. 81.) without fruit, which may belong to this genus, or may possibly be *S. Delesserioides*. But without a comparison with Sonder's plant this question cannot be settled. As I wish to preserve a record of Mr. Mylne's plant, I shall here add a short description of it, in the hope that some botanist visiting Western Australia, may meet with it in a more perfect state.—

"*Mylne in Herb. Lemann*, no. 81. *Stem* one to two inches long, branched, a line or more in thickness, cartilaginous, two-edged; branches one to two lines wide, with a very broad costa, and narrow marginal wing, which gradually expands upwards into the lamina of a linear-obovate or cuneate, obtuse phyllodium, in whose upper part the costa gradually dissolves. From the primary phyllodium spring others, one to two inches long. The specimen is much injured, and I am not quite sure whether the margin, which is wavy, is normally lobed, or whether it be simply torn. In the solitary specimen seen, the discs of the newest phyllodia produce small distorted orbicular leafy processes, very convex at one side, and hollow at the other, as if a ceramidium had been there and had burst; but I perceive no trace of fruit, and regard them as simply abortive phyllodia. *Substance* of the stem cartilaginous, of phyllodium thickish membranous. Surface of the frond, under a lens of low power, appearing highly reticulated, with oblong areolæ, arranged in lines obliquely directed from the centre of the lamina to its margin; but these areolæ are caused by large internal cells, the surface cells being very minute. *Colour*, a fine purple-pink. The habit of this plant is like that of *Jeannerettia*, but its structure is very different.

GENUS 7. POLLEXFENIA, *Harv.*

Frons plana, membranacea, purpureo-rosea, expansa, enervis, lacero-fissa, areolata, è cellulis polygonis formata. *Ceramidia* ovata, poro pertusa, pericarpio crasso carnoso, è frondis paginâ orientia, sessilia v. pedicellata, sporis pyriformibus fœta. *Stichidia* lanceolata, v. *sporophylla* orbicularia per totam frondem sparsa. Algæ *Capenses* et *Australasicæ*, habitu *Nitophyllum* referentes.

This genus, named in honour of the *Rev. J. H. Pollexfen*, a successful explorer of the marine-botany of the Orkney Islands, contains two groups, which may hereafter be separated; perhaps they ought never to have been combined. The first, to which the name *Pollexfenia* will be preserved, is distinguished by its delicate substance being traversed internally by a system of pellucid branching striæ, and by having stichidia; the second by its thicker substance, destitute of striæ, and by having its tetraspores contained in sporophylla, should that character be ascertained to attach to both species. At present, however, the tetrasporic fruit of *P. laciniata* is unknown.

Subgenus 1. POLLEXFENIA.

1. Pollexfenia pedicellata, *Harv.*, fronde latissima pinnato-dichotoma, laciniis divaricatis pinnatifidis longitudinaliter pellucido-striatis, striis dichotomis, sinubus rotundatis, apicibus obtusis, ceramidiis ovatis pedicellatis, stichidiis fasciculatis ovato-lanceolatis per frondem sparsis. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 431. (Tab. V.)

Hab. Near George Town, Tasmania, *R. Gunn, Esq.* (*v. s. in Herb. T. C. D. c. cl. Hooker* !)

Frond four to five inches long, and equally broad, delicately membranous, with an orbicular outline, more or less deeply divided in a mixed dichotomous and pinnate manner; the segments spreading, simple or pinnatifid; the spaces between them wide and rounded; the apices obtuse, and the margin entire. The substance is very thin, areolated, and destitute of costa, but the frond is traversed throughout with a wide band of pellucid veinlets, or internal filaments, which have the appearance, under a pocket lens, of delicate striæ. These veinlets originate at the base of the frond, and radiate toward all the segments, passing through the centre of each, and evidently supply the place of midrib, without taking its appearance. They are most obvious toward the apices, which is not usually the case with costæ or nerves. *Colour*, probably a rosy-purple, becoming brownish red in drying. *Ceramidia* abundantly scattered over both surfaces, ovate, acuminate, borne on stalks as long as themselves. *Stichidia* also thickly dispersed, tufted, ovato-lanceolate.

Tab. 5. Pollexfenia pedicellata. Fig. 1. A frond:—*of the natural size.* 2. Apex of one of the lobes. 3. Portion of the lamina, with a *ceramidium.* 4. Spores from the same. 5. Portion of the lamina with a tuft of *stichidia.* 6. A tetraspore. 7. Cross section of the lamina:—*all magnified.*

Subgenus 2. RHODOSERIS.

2. Pollexfenia (Rhodoseris) laciniata, *Harv.*, fronde flabelliformi basi cuneata in segmentis lineari-cuneatis palmato-multifidis profunde fissa, margine lacero-dentato sinubus obtusis, apicibus laceratis, ceramidiis sessilibus intra-marginalibus. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 432. (Tab. VI.)

Hab. On the shore near "Farmer Peck's," Muysenberg, Cape of Good Hope, growing with *Plocamium corallorhiza*, near low-water mark, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds tufted, six to seven inches high, narrow at the base, becoming gradually wider till they are half an inch broad; then spreading with a fan-shaped outline, and divided in a partly dichotomous, partly pinnate manner, the segments generally half an inch wide, nearly linear, erecto-patent, and again dividing in the same irregular manner. The axils are everywhere rounded, but not very broad. The apices are generally jagged; and the margin either toothed, lacero-dentate or almost ciliate. *Ceramidia* sessile, generally near the margin, few on each frond, depresso-ovate or mamillæform thick and fleshy. *Stichidia* (or sporophylla?) unknown. *Colour* a fine purple-red, with changeable rainbow tints when fresh, becoming darker and duller in drying. It adheres to paper.

Tab. 6. POLLEXFENIA LACINIATA. Fig. 1. A frond:—*of the natural size.* 2. Portion of the lamina. 3. Cross section of the same. 4. A ceramidium. 5. Section of the same. 6. Tufts of spores:—*all magnified.*

3. POLLEXFENIA (RHODOSERIS) cartilaginea, *Harv. and Grev.*, fronde cartilaginea incrassata palmato-multifida, laciniis basi cuneatis subdichotomis, margine integro plano v. undulato, sinubus rotundis, apicibus obtusis, ceramidiis (ignotis), sporophyllis orbicularibus pedicellatis applanatis per frondem sparsis.

HAB. Swan River Colony, *Mr. Mylne*, no. 60. (*v. s. in Herb. cel. Lemann.*)

I have only seen a single specimen of this species, which is probably a fragment of a larger plant. This is a multifid segment, about four inches long, cuneate at the base, linear, about half an inch broad, divided into four principal laciniæ, each of which is cloven in a manner between dichotomous and pinnatifid, the ultimate divisions generally narrower. The axils are rounded, the apices probably (most of them being injured) blunt, and the margin is entire, and generally flat, but here and there somewhat undulated. The substance is cartilaginous, fully twice as thick as in *P. laciniata*, but the structure is exactly similar, consisting of about five rows of oblong, rectangular cellules of equal length. The lower and middle parts of the laciniæ are well covered with orbicular, pedicellate, scattered, spore-leaflets, containing numerous scattered tetraspores. *Colour*, evidently much faded, a purplish-pink.

GENUS 8. KÜTZINGIA, *Sond.*

Frons membranacea, cartilaginea, plana, corticata, costata, penninervis, distiche pinnatifida. *Cellulæ* interiores tetrahedræ, in zonas parallelas transversales ordinatæ. *Ceramidia* ignota. *Stichidia* oblonga, pedicellata, è nervis transversis enatæ, duplici serie tetrasporas foventia. Alga *Australasica* atro-purpurea, rigidiuscula, eleganter striata et areolata; laciniis linearibus, canaliculatis.

KUTZINGIA canaliculata, *Sond. in Bot. Zeit.*, 1845. p. 54. RYTIPHLÆA canaliculata, *Grev. in Edin. Journ. of Nat. and Georgr. Sc. N. S.* vol. iii. t. 4. f. 1. (TAB. IX.)

HAB. New Holland, *Fraser*. Swan River Colony, *Preiss*; *Mr. Mylne* (*v. s. in Herb. T. C. D. comm. cl. Greville*; *cl. Binder.*).

Frond four to six inches long, or perhaps much more, from a quarter to half an inch broad at the base, gradually narrower upwards, and about a line in breadth at the apex, furnished below with a strong, thick costa, which gradually becomes more slender upwards, but is continued to the point; linear, pinnatifid or bipinnatifid, the lower half of the laciniæ bare of pinnules; all the divisions erecto-patent, linear, subacute, channelled, the margin incurved or involute, and very entire. The frond is membranaceous, translucent, and its surface marked with transverse and longitudinal lines, which cross each other at right angles, and divide the lamina into oblong areolæ with great regularity. These lines are the walls of large, internal cellules or lacunæ, a stratum of which, of equal size, forms the parenchyma. The cells of the surface are small, in several rows, and of irregular shape. At spaces about a line apart, the frond is marked with a thicker transverse line, or nervure, on which, at both surfaces of the frond, are borne the *stichidia*, which are thus disposed, in transverse lines, across the frond. They are lanceolate, pedicellate, inflexed at the apex, and mostly tufted. *Ceramidia* unknown.

I regret that my figure represents so small a specimen, but when the plate was drawn I had not seen larger. I have recently had the opportunity of examining a fragment of a much larger specimen, in Dr. Lemann's Herbarium, to judge from which, for it is only the apex of a frond, it seems probable that this plant attains a considerable size, and becomes much more decompound. It is much to be regretted that collectors are not sufficiently alive to the importance of obtaining uninjured and full-grown specimens.

Tab. 9. KUTZINGIA CANALICULATA. Fig. 1. A young frond:—*of the natural size*. 2. Apex of a lacinia. 3. A stichidium. 4. Minute portion of the frond, showing the surface. 5. A transverse section of the frond, showing the internal structure.

GENUS 9. AMANSIA, *Lamour.*

"*Frons* plana, distiche pinnata, costata (costa rarissime subnulla), transverse parallele zonata, zonis hexædre areolatis. *Stichidia* è margine frondis ramosa fructiculosa," tetrasporas "simplici vel duplici serie foventia. *Ceramidia* subglobosa, ad processus marginales ramosos sessilia, sporidia obovata continentia." *J. Ag. in Linn.* vol. xv. p. 25.

Two southern extra-tropical species of this genus are described, with neither of which am I acquainted. I shall therefore briefly insert their specific characters as given by Agardh. All the other species are natives of the Tropical Ocean. *Fucus lineatus*, Turn., which Agardh refers to *A. multifida*, does not appear to me, judging by Turner's description and figure, to accord with that species, and I rather suppose it to be a species of *Epineuron*.

1. AMANSIA? semipennata, *Lamour.* "caule teretiusculo vage ramoso, ramis in folia membranacea abeuntibus transversim striata acinaciformia dorso pectinato-dentata." *Lamour. Ess.* p. 55. t. 5. f. 4, 5. *Ag. Sp. Alg.* vol. i. p. 195. *Grev. Syn.* p. xlvi. *Endl. Syn.* p. 48.

HAB. New Holland, *Lamouroux*.

A most remarkable plant, very little known to botanists, and, next to *Claudea*, certainly the most singular of southern Algæ. Lamouroux's figure represents a branching stem, the branches terminating in linear, falchion-shaped, costate phyllodia, one margin of which is quite entire, the other deeply toothed or pinnatifid; the whole resembling a saw. From the ribs of these primary phyllodia, others spring proliferously. The fruit is unknown. If *A. multifida* be considered the type of the genus, this will probably be eventually separated; but too little is yet known to justify such a step.

2. Amansia Binderi, *J. Ag.*, "fronde pusilla lacera dichotoma vageque et subflabellatim zonata, sinubus laciniarum fructigeris." *J. Ag. in Linn.* vol. xv. p. 26.

Hab. Cape of Good Hope, parasitical on *Codium tomentosum*.

"*Fronds* minute, densely aggregated on the surface of the *Codium*, shapeless or irregularly dichotomous, the margins lacerated; laciniæ wedge-shaped, entire, cut or dichotomous, transversely zoned."

Genus 10. EPINEURON, *Harv.*

Frons plana, membranacea vel cornea, linearis, costata, distiche ramosa, areolata. *Cellulæ* interiores magnæ, polyhedræ, transversim ordinatæ; exteriores pluri-seriatæ, pusillæ, coloratæ. *Ceramidia* (ignota). *Stichidia* è costa enata, lanceolata, involuta, duplici serie tetrasporas foventia. Algæ *australes*, v. *intratropicæ* (?) frondosæ, atro-rubescentes, ad marginem dentatæ v. ciliatæ.

This little group is nearly allied to *Dictymenia*, from which it is essentially distinguished by the position of the fruit, which is formed upon the midrib of the frond, not by a metamorphosis of the marginal teeth. I formerly was disposed to place *Fucus fraxinifolius*, Turn., here also, but the habit of that species is very different from that of the rest, and it is perhaps better to consider it the type of a separate genus, differing from *Epineuron*, in being proliferous, with penninerved phyllodia. *Fucus confertus*, Turn., which, in the 'London Journal of Botany,' I doubtfully referred here, appears to be an undoubted *Dictymenia*, and is described and figured under that genus.

1. Epineuron spirale, *Harv.*, caule crasso lignoso ramis lateralibus densissimis onusto, ramis membranaceis subbipinnatifidis spiraliter tortis costa tenui percursis, laciniis linearibus erectis argute serratis. (Tab. IX.).

Delesseria spiralis, *Lamour. Ess.* p. 36. t. 3. f. 2.

Dictymenia spiralis, *Sonder*.

Rhodomela tridens, β. spiralis, *Ag. Sp. Alg.* vol. i. p. 374?

Epineuron Backhousii, *Harv. in Lond. Journ. Bot.* vol. iv. p. 532. *in note*.

HAB. New Holland, *Lamouroux.* Swan River Colony, *Backhouse, Preiss, Mylne* (*v. s. in Herb. T. C. D. comm. cl. Backhouse; cl. Binder*).

Root? *Stem* probably many inches long, simple? or alternately branched? irregularly curved, or spirally twisted, woody, two to three lines in diameter, tough and hard, corrugated, obscurely winged, densely clothed throughout with lateral branches. *Branches* membranaceous, thin, four to eight inches long, from $\frac{1}{8}$ to nearly $\frac{1}{4}$ of an inch in breadth, preserving nearly the same breadth throughout, rather narrow at the apex, pinnatifid or bipinnatifid; the laciniæ very erect, linear, spirally twisted, sharply serrate, the serratures a line apart, with rounded interstices. *Colour*, when dry, reddish brown, probably a purplish pink when recent. *Stichidia* forming interrupted lines upon the costa, very dense, lanceolate, involute, containing a double row of tetraspores. *Ceramidia* "globose, pedicellate, issuing from the costa, or more frequently terminating the marginal teeth." *Sond.* These last I have not seen.

This is a very different plant in structure and substance from *Dictymenia tridens,* with which the elder Agardh has confounded it.

Tab. 9. EPINEURON SPIRALE. Fig. 1. A branch:—*of the natural size.* 2. Apex of a lacinia. 3. A stichidium. 4. A tetraspore. 5. Minute portion of the surface of the frond, to show the transversely ordinate cellules. 6. Transverse section of the frond, showing the internal structure:—*all magnified.*

2. EPINEURON Colensoi, *Hook. fil. et Harv.*; fronde lineari angustissima costata badia transversim striata siccitate rigida vage pinnatim bi-tripinnatimve ramosa, pinnis pinnulisque longissimis simplicissimis erectis inciso-serratis, serraturis alternis erecto-patentibus lato-subulatis acutis, stichidiis nervum creberrime vestientibus filiformibus incurvo-hamatis simplicibus. *Hook. et Harv. in Lond. Journ. Bot.* vol. iv. p. 533. (TAB. X.)

HAB. East Coast of New Zealand, *Rev. Mr. Colenso.* Bay of Islands, *Dr. Lyall* (*v. s. in Herb. T. C. D. comm. cl. Hooker*).

Root? *Frond*, in our specimens (which are broken), five to six inches long, and not a line in breadth, destitute of branches below, alternately branched above, rigid, somewhat horny. *Branches* spreading, three to four inches long, either simple, or pinnate in their upper part, or sub-bipinnate, very narrow, exactly linear, equally inciso-dentate throughout, transversely striate, furnished with a percurrent costa, which is strongly defined below, but becoming less and less obvious towards the apex. Marginal teeth a line apart, broadly subulate, erecto-patent, acute. *Apices* of the branches involute when dry. *Colour*, dark brownish-red. *Midrib*, in our specimens, densely covered with narrow fusiform circinate stichidia. Under a lens of low power the frond appears to be closely striate in an obliquely transverse direction, owing to the arrangement of the cellules in the interior of the frond. This appearance is lost when the surface is more highly magnified, because the cells of the surface are minute, and irregularly disposed. When dry, the substance is between horny and membranous, and does not adhere to paper.

Tab. 10. EPINEURON COLENSOI. Fig. 1. A frond:—*of the natural size.* 2. Apex of a lacinia. 3. A stichidium. 4. Transverse section of the frond:—*magnified.*

3. Epineuron? lineatum, *Hook. fil. et Harv.*, "fronde membranacea plana lineari ad medium costata è costa prolifera et bipinnatim ramosa tota lineis nigricantibus parallelis transversim striata, ramis sparsis, ultimis dentato-fimbriatis." *Turn.*

Epineuron lineatum, *Hook. et Harv. in Lond. Journ. Bot.* vol. iv. p. 533.

Fucus lineatus, *Turn. Hist. Fuc.* t. 201.

Hab. Shores of New Zealand, *Sir Joseph Banks, Bart.*

"*Frond* four inches or more in length, rising with a subcylindrical stem, about the thickness of a sparrow's quill at its base, whence it gradually grows more narrow and more thin, and wholly disappears near the middle of the height of the plant, after which the frond becomes completely flat and nerveless; this stem, or midrib, is winged on both sides by a membrane not half a line wide, and everywhere linear, as are also the nerveless branches; the frond is once or twice irregularly forked, the segments beset with scattered, nearly horizontal branches, from half an inch to an inch long, all of them narrow at their base, then linear, and occasionally, towards their apices, producing other similar, but smaller ones; the ultimate branches are undivided, but regularly fringed from top to bottom with patent teeth, standing close to each other, broadly subulate, scarcely half a line long, and very slightly incurved. Similar branches also occasionally grow scattered from the midrib. *Colour* pink, with a slight tinge of purplish and brown, transparent. *Substance* cartilaginous in the midrib, in the branches an exceedingly thin and slender membrane." *Turn.* (somewhat abridged.)

I am unacquainted with this plant, which is referred by Agardh to *Amansia multifida*, Lamour., but an attentive perusal of the above description has persuaded me that it must be something very different. It has so many points in common with *E. Colensoi*, from which it differs in colour and habit, as appears by Turner's figure, that, in the absence of more direct information, I venture to place it provisionally in this genus.

Genus 11. SPIRHYMENIA, *Decaisne.*

Frons plana, linearis, sub-ecostata, distichè ramosa, transversim striata, è cellulis pluriseriatis superficiem versus sensim minoribus formata. *Ceramidia* (ignota). *Stichidia* fasciculata, intra-marginalia, è pagina frondis superiori enata. Alga *Austro-Africana*, corneo-membranacea, atro-rubescens, pinnatifida, laciniis spiraliter tortis argute serratis.

Nearly allied to *Epineuron* and to *Dictymenia*, from both of which it differs in the position of the fruit.

1. Spirhymenia serrata, *Dne. Archiv. Mus.* vol. ii. p. 177. (Tab. VII.)

Dictymenia serrata, *J. Ag. in Linn.* vol. xv. p. 27. *Endl. Syn.* p. 47.

Carpophyllum serratum, *Suhr. in Fl.* 1840. p. 258.

Hab. Port Natal, South Africa, *Drege* (*v. s. in Herb. T. C. D. ex Drege!*).

The specimens I have examined are imperfect, and consist of branches of possibly a large Alga. They are three to four inches long, scarcely a quarter of an inch in width, secundly or alternately branched, the major and minor branches being all spirally twisted, linear, slightly narrowed to a subacute point, very erect, and sharply toothed throughout, traversed by a very obscure or obsolete central line, and appearing, under a lens of moderate power, closely striate transversely. Marginal *teeth* deltoideo-subulate, a line asunder; the interstices rounded. *Substance* horny, membranous. *Structure* dense, consisting of several rows of coloured polygonal cells, which become gradually smaller toward the circumference. *Ceramidia* unknown. *Stichidia* lanceolate, pedicellate, involute at the apex, tufted; tufts springing from the upper surface only of the frond, within the margin, on the centre of the base of the marginal tooth. *Colour* reddish brown, when dry.

Tab. 7. Spirhymenia serrata. Fig. 1. A branch:—*of the natural size.* 2. Apex of a lacinia. 3. Marginal tooth with its tuft of stichidia. 4. A stichidium. 5. A transverse section of the frond, showing the internal structure:—*all more or less highly magnified.*

Genus 12. DICTYMENIA, *Grev.*

Frons plana, membranacea, linearis, costata, disticho ramosa, areolata; areolis irregularibus, polygonis, nec transversim ordinatis. *Ceramidia* ovata, marginalia, fasciculum sporarum pyriformium continentia. *Stichidia* è ramulis v. dentibus marginalibus formata, simplicia vel ramosa, tetrasporas duplici serie foventia. Algæ *Australes, intra-tropicæ*, et etiam in mari *Mediterraneo* observatæ, distiche ramosissimæ, nunc volubiles, sæpissime margine dentato v. fimbriato, roseæ v. sæpius fusco-rubescentes.

1. **Dictymenia** tridens, *Grev.*, fronde bi-tri-v. pluries pinnata lineari costata, costa ante apicem evanescenti, pinnis pinnulisque crebris apicem versus sensim minoribus angustioribusque erecto-patentibus alternis margine laciniato-dentatis, dentibus tri-multifidis articulatis laciniis subulatis acutis, ceramidiis ovato-globosis sessilibus, stichidiis furcatis. (Tab. VII.)

Dictymenia tridens, *Grev. Syn.* p. l. *Endl. Syn.* p. 47. *J. Ag. in Linn.* vol. xv. p. 27. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 430.

Rhodomela tridens, *Ag. Sp. Alg.* vol. i. p. 373.

Fucus tridens, *Turn.* t. 255.

Hab. Coast of New Holland, *Péron.* George Town, Tasmania, *R. Gunn, Esq.* (*v. s. in Herb. T. C. D., comm. cl. Hooker.*)

Fronds six to twelve inches long, from less than a line to a quarter of an inch in breadth, flat and membranaceous, linear, narrowed to the base and apex, furnished in the lower part with a strong midrib, which gradually becomes thinner and fainter upwards, and disappears below the apex, simple or divided into three or four principal branches. Main branches bi-tripinnate, ovate in circumscription; pinnæ closely set, erecto-patent, alternate; pinnules similar, gradually shorter toward the apices; the margin in every part of the frond, save the denuded bases of old stems, furnished with minute, forked, trifid, or four- to six-fid ramuli, about a line in length, subulate, transversely striate or spuriously jointed like those of an *Alsidium*. *Colour* dark reddish or chesnut-brown, when dry. *Ceramidia* ovato-globose, wide-mouthed, sessile, on the sides of the marginal teeth. *Stichidia* distorted or forked, formed from the marginal teeth, which are then very much developed and multifid.

This species varies considerably in breadth, and the narrower specimens have very much the habit of an *Alsidium*, or even of a compressed inarticulate *Polysiphonia*.

Tab. 7. DICTYMENIA TRIDENS. Fig. 1. A small branch:—*of the natural size*. 2. A fertile ramulus, with a ceramidium. 3. A fertile ramulus, with stichidia. 4. A cross section of one of the branches of the frond:—*all magnified*.

2. DICTYMENIA fimbriata, *Grev.*, "fronde membranacea plana lineari obsolete costata ramis subalternis enormiter pinnata, margine utrinque fimbriata ciliis patentibus abbreviatis subulatis demum in stichidia lanceolata intumescentibus." *Turn.*

DICTYMENIA fimbriata, *Grev. Syn.* p. L. *Endl. Syn.* p. 47. *J. Ag. in Linn.* vol. XV. p. 27.

FUCUS fimbriatus, *R. Br. in Turn. Hist. Fuc.* t. 170.

HAB. On the north coast of New Holland, *R. Brown, Esq.*

I have seen no specimens of this species; which was gathered by Mr. Brown on some part of the intertropical coast of the Australian continent. It has, therefore, no proper claims to be admitted into this work, but I am unwilling to pass it over altogether, because of its close affinity with the preceding species, and because it may possibly occur in some more southern locality.

3. DICTYMENIA conferta, *Harv.*, fronde lineari tenui-membranacea; pluries pinnata serrulata costa valida apicem versus obsoleta percursa, venulis oppositis crebris è costa ad marginem oblique proficientibus notata, pinnis pinnulisque patentibus serratis basi angustatis linearibus obtusis, ceramidiis marginalibus ovatis lacinulas abbreviatas terminantibus. (TAB. VIII.)

DELESSERIA conferta, *Ag. Sp. Alg.* vol. i. p. 177. *Grev. l. c.* *Endl. Syn.* p. 220.

FUCUS confertus, *R. Br. in Turn. Hist.* t. 184.

HAB. At Kent Islands, *R. Brown, Esq.* Tasmania, *R. Gunn, Esq* (*v. s. in Herb. Hooker*).

Our specimen, which is imperfect, is about four inches long, and about as much in the expansion of its branches; the membrane one to two lines in breadth. The larger branches are bipinnate, the smaller simply pinnate; pinnæ and pinnulæ alternate, patent, narrowed at the base, and slightly so toward the apex, the margin through the whole extent toothed with shallow serratures. The costa, which in the lower part of the frond is very strong, cylindrical, cartilaginous, filling up half the breadth of the lamina, gradually diminishes upwards in breadth, and becomes more and more faint, until, in the upper branches and in all the pinnulæ, it is reduced to an internal, central line. In every part the frond is penninerved with slender, straight, opposite, closely-set veinlets, issuing from the costa, and proceeding at an angle of about 60° to the margin, where they terminate in the teeth. *Ceramidia* solitary, ovate, containing a tuft of pyriform spores, terminating short laciniæ. On the midrib, and on various parts of the lamina, are frequently found irregularly shaped, wart-like bodies, which do not appear to have any connection with the fructification. Cellular structure lax; the surface cells very minute.

Tab. 8. Dictymenia conferta. Fig. 1. A frond:—*of the natural size.* 2. Part of a lacinia. 3. Ceramidium. 4. Part of the frond, with one of the wart-like bodies. 5. Transverse section of the frond:—*all more or less highly magnified.*

4. Dictymenia prolifera, *J. Ag.*, "fronde concatenato-articulato, articulis lineari-lanceolatis costatis." *Ag.* Dictymenia prolifera, *J. Ag. in Linn.* vol. xv. p. 27.

Amansia prolifera, *Ag. Sp.* vol. i. p. 194.

Hab. New Holland. *Mus. Paris.*

"*Frons* palmaris ramosa, ramis è costa exeuntibus, concatenato-articulatis, vel proliferis. *Articuli* lanceolati, unciales, 1½ lineam lati, in petiolum attenuati, obsoletius costati, et lineis parallelis transversalibus striati. *Fructus* ignotus. *Color* obscure purpureus, opacus. *Substantia* membranacea crassior." *Ag. l c.*

I am unacquainted with this plant, which probably belongs to some other genus; possibly to *Kützingia,* for Prof. J. Agardh states that it scarcely differs from *Rytiphlæa* (*Kützingia*) *canaliculata,* Grev., a relationship that I should scarcely have guessed by reading the above description.

Genus 13. ALSIDIUM, *Ag.*

Frons filiformis vel subcompressa, pinnatim ramosa, areolata, cellulis polygonis corticata, superne transversim striata. *Caulis* e cellulis (*siphonibus*) radiantibus pluribus cavitatem centralem cingentibus strato externo cellularum minarum enormium circumdatis conflatus. *Ceramidia* ——? *Stichidia* lanceolata, axillaria (v. "ramentorum apice sita," *J. Ag.*), tetrasporas simplici duplicive serie foventia.—Algæ *maris calidioris,* utriusque hemisphærii incolæ, rigidæ, cartilagineæ, fruticosæ, ramosissimæ, purpurascentes.

This genus, originally founded by the elder Agardh on a Mediterranean species, the fruit of which is imperfectly known, has been extended by Prof. J. Agardh to include two tropical species, and the *Rhodomela scorpioides,* Ag. The last has, more recently, been proposed as the type of a new group (*Bostrychia*) by Dr. Montagne, who has described several new species having a closely analogous structure, and Dr. Hooker and myself have added some others. The *Bostrychiæ* have a very peculiar habit, and their structure is considerably different from that of the original *Alsidium,* which is indeed scarcely distinguishable from the inarticulate species of *Polysiphonia.*

1. Alsidium triangulare, *J. Ag.*; fronde cartilaginea triquetra pinnato-dichotoma ramo-

sissima ramulis brevibus furcatis trifariam imbricatis obsita, stichidiis ad axillas ramulorum fasciculatis.

ALSIDIUM triangulare, *J. Ag. in Linn.* vol. xv. p. 28.

THAMNOPHORA triangularis, *Ag. Sp. Alg.* vol. i. p. 226.

FUCUS triangularis, *Gm. Hist.* t. 8. f. 4. *Esp.* t. 119. *Turn.* t. 33.

HAB. Shores of New Zealand, *Sir Joseph Banks.* New Holland, *R. Brown, Esq.* (*v. s. in Herb. T. C. D.*)

Frond 4–6 inches long, much branched. *Stem* a line in diameter at the base, three-angled, cartilaginous, bare of branches below, much divided in the upper part, forming a tree-like frond. *Branches* alternately multifid, very erect, somewhat fastigiate, closely set throughout their whole length with minute, spirally inserted, three-ranked, forked, imbricated ramuli, from half a line to a line in length, and very erect. *Branches* and ramuli pellucid, closely marked with transverse striæ. A cross section of a branch exhibits seven principal tubes surrounding a central cavity, and several rows of smaller cellules gradually diminishing toward the circumference. *Stichidia* minute, tufted in the axils of the ramuli, linear, distorted, containing tetraspores in a single or double row. *olour* a full red, becoming darker in drying.

I have never seen a specimen of this plant from the Southern Ocean, and have been obliged to make my description from a West Indian. It is a common West Indian species.

2. ALSIDIUM ericoides, *Hering.*; fronde tereti continua filiformi ramosa, ramentis brevibus subarticulatis subulatis dense imbricatis vestita. *Hering in An. Nat. Hist.* vol. viii. p. 91. *Endl. Syn.* p. 46.

HAB. Port Natal, South Africa, *Krauss.*

This I have not seen, unless it be the same with my *Bindera cupressina,* with which the description well accords; but the structure of my plant is very uulike that of an *Alsidium,* and exactly agrees with *Bindera.*

GENUS 14. RYTIPHLÆA, *Ag.*

Frons filiformis v. compressa, pinnatim ramosa, opaca, cellulis minutis corticata, superne crebre transversim striata. *Caulis* è cellulis (*siphonibus*) pluribus cavitatem centralem radiatim cingentibus, strato cellularum minarum circumdatis conflatus. *Ceramidia* ovata, sparsa. *Stichidia* lanceolata, v. lateralia pedicellata, v. ramulos terminantia.—Algæ *maris calidioris* utriusque hemisphærii incolæ, purpureæ, cartilagineæ, rigidæ, siccitate nigrescentes.

This genus is scarcely distinguishable from *Rhodomela,* or from the opake species of *Polysiphonia.* The structure is essentially the same.

1. **Rytiphlæa** pinastroides, *Ag.*; fronde tereti vage ramosa, ramis secundariis pectinato-pinnatis, pinnis secundis basi attenuatis apice uncinatis. *Harv. Phyc. Brit.* t. 85.

Rhodomela pinastroides, *Ag. Sp.* vol. i. p. 381. *Hook. Fl. Brit.* vol. ii. p. 294.

Hab. Shores of New Zealand, *Sir Joseph Banks.*

Fronds 4–10 inches high, tufted, rising from a broad fleshy disc, cylindrical, as thick as whipcord below, much branched and bushy. Main branches alternate or subdichotomous, densely clothed below with short subulate ramuli; in their upper part set with patent pectinato-pinnate secondary branches. *Pinnæ* nearly opposite, secund, their apices generally hooked inwards. *Ceramidia* ovate, stalked, lateral on the pinnæ.

I have not seen any southern specimen of this plant, which is a native of the south shores of England and the coasts of France and Spain.

2. (?) **Rytiphlæa** australasica, *Endl.*; "fronde spurie articulata laxe ramosa, ramis vagis sæpius et oppositis, raro 'ternis, ramulis longissimis incurvis, lomentis' (stichidiis?) 'in ramulis hinc inde glomerulatis falcato-incurvis gongyla' (tetrasporæ) 'uniseriata foventibus'." *Mont.*

Rhodomela australasica, *Mont. Herb. Webb. Pl. Cell. Canar.* p. 154, *in note.*

Hab. On the roots and stems of *Ruppia antarctica.* Tasmania, *Labillardière.*

I am not acquainted with this plant.

3. **Rytiphlæa** (?) complanata, *Ag.*; fronde plano-compressa pinnata v. bi-tripinnata, pinnis inferioribus abbreviatis abortisve, superioribus elongatis strictis erectis virgatis, ramulis subulatis distichis erecto patentibus crebris, axillis acutis.

Rytiphlæa complanata, *Ag. Sp. Alg.* vol. ii. p. 54. *J. Ag. in Linn.* vol. xv. p. 26.

Polysiphonia cristata, *Harv. in Mack. Fl. Hib.* part 3. p. 205. *Harv. Man.* p. 85.

Hab. On rocks near low-water mark. Cape of Good Hope, in several places, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Root branching. *Fronds* erect, 3–4 inches high, half a line in diameter below, somewhat attenuate upwards, plano-compressed, frequently naked in their lower half, or clothed with the remains of branches or abortive ramuli, pinnate above with alternate, distichous branches, the uppermost of which are gradually longer; all very erect with acute axils. These branches are furnished throughout with lateral ramuli, the lowest of which are short, subulate, and simple, the uppermost gradually longer and inciso-pinnatifid, or pinnate. There is much diversity in the comparative length of the branches in different specimens. The ramuli are very erect, and under a lens of low power appear to be transversely striate. A transverse section shows several tubes surrounding a central cavity, with a wide border of external cells.

A widely distributed species, being found in the Mediterranean and along the Atlantic shores of Europe as far north as Ireland, where it has been only observed in Bantry Bay. The Cape specimens are larger, coarser and less branching than European individuals, and the transverse striæ less obvious; but can scarcely be referred to any other species.

4. **Rytiphlæa** (?) cloiophylla, *J. Ag.*; fronde plano-compressa basi nudiuscula superne flabellatim ramosa, ramis patentibus bi-tripinnatis, pinnis elongatis, pinnulis creberrime alterne multifidis, axillis rotundatis, ramellis subulatis, ceramidiis ovatis lateralibus sessilibus, tetrasporis in ramellis nidulantibus uniseriatis.

Rytiphlæa cloiophylla, *J. Ag. in Linn.* vol. xv. p. 26. *Endl. Syn.* p. 48.

Rhodomela cloiophylla, *Ag. Sp. Alg.* vol. i. p. 375.

Hab. Cape of Good Hope, *Agardh*, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Root branching. *Fronds* 4–8 inches high, half a line in diameter at base, compressed, simple or forked, generally more or less naked below, or furnished with short branches, or the remains of broken branches, but sometimes equally branched along its whole length. *Branches* distichous, alternate, long, patent, bi-tripinnate, compressed, the axils rounded. *Pinnæ* 1–3 inches long, naked at the base for the space of a quarter to half an inch, from thence to the apex closely and regularly furnished with alternate pinnules, the lowermost of which are rather the shortest. *Pinnules* pinnatifid, or, in specimens with tetrasporic fruit, bi-pinnate, the ultimate ramuli subulate and erecto-patent. *Axils* rounded. *Apices* acute. Transverse striæ not obvious in the dry specimens. *Ceramidia* ovate, sessile on the sides of the penultimate ramuli, occupying the position of a ramulus. *Tetraspores* formed in the ramuli, which are not otherwise altered than in being more compound than usual. *Colour* a dark, rich red-brown.

A very fine species, larger and more flabelliform than the preceding, but very closely allied to it, and, in the opinion of some authors, not distinct.

5. **Rytiphlæa** dumosa, *Harv.*; fronde compressa basi nudiuscula superne ramosissima transversim striata, ramis divaricato-patentibus bi-tripinnatis, pinnis elongatis, pinnulis simpliciter pinnatis, ramulis pusillis subsimplicibus apice furcatis emarginatisve, axillis rotundatis.

Hab. On the shores of False Bay, near Muysenberg, Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Root branching. *Fronds* 4–5 inches high, branched from the base, or rising with a simple stem, which is rough with broken branches, and at the height of an inch branched, and repeatedly divided above in a bushy manner, all the divisions, however, being distichous. Principal *branches* slightly zigzag, bi-tripinnate, the pinnæ elongate, not a quarter of an inch apart, sub-simply pinnate in their lower part, bi-pinnate above. *Pinnules* slender, the lowermost toothed at the margin or subpinnulate; the upper gradually more evidently pinnated. Ultimate ramuli patent, very short, either emarginate or minutely forked at the apex. Transverse striæ sometimes very visible, in other specimens obscure. All the axils are remarkably patent and rounded.

More slender than either of the preceding, and much more bushy and intricately branched, all the divisions patent; the ultimate ramuli emarginate. Can this be the *Rytiphlæa firma*, Ag. Sp. vol. ii. p. 54, the native country of which is unknown?

GENUS 15. ACANTHOPHORA, *Lamour.*

Frons filiformis, vage ramosa, opaca, cellulis minutis corticata, spinulis pyramidatis echinata. "*Ceramidia* in spinulis sessilia, ovata, apice regulariter aperta, *granulis* pyriformibus, ad placentam centralem affixis fœta. *Tetrasporæ* intra *stichidia* è spinulis transformatis ortæ biseriatæ."—*Endl.* Algæ *maris calidioris* incolæ, atro-purpurascentes cartilagineæ, inordinate ramosæ, sæpe intricatæ.

1. ACANTHOPHORA Thierii, *Lamour.*; fronde vagè ramosa spinulosa, spinulis subquinis aggregatis distantibus.—*Ag.* ACANTHOPHORA Thierii, *Lamour. Ess.* p. 44.

CHONDRIA acanthophora, *Ag. Sp. Alg.* vol. i. p. 363.

HAB. Shores of the Falkland Islands, *Gaudichaud, sec. Ag.* (*v. s. in Herb. T. C. D.*)

Fronds 4–6 inches long, forming lax, intricate tufts, filiform, vaguely branched; the branches alternate or secund, very patent, elongate, distant, but little divided, gradually attenuate, furnished along their whole extent with minute, tooth-like, alternate, spirally inserted ramuli, half a line in length and from one to two lines apart, cleft at the apex into 3–5 short spine-like teeth. *Substance* cartilaginous. *Colour* dark purple. There are no outward appearances of joints in any part, but the internal structure of the frond is similar to that of *Alsidium* or *Rytiphlæa.*

This species is common along the shores of tropical America, and is found as far north as Florida. I have seen no Falkland Island specimens, nor was *A. Thierii* observed by the botanists attached to the Antarctic Expedition, notwithstanding their zealous exploration of the shores of the Falklands. Can there be any mistake in the habitat? My description is necessarily taken from a West Indian specimen.

GENUS 16. RHODOMELA, *Ag.*

Frons filiformis, ramosissima, inarticulata, opaca, cellulis minutis irregularibus corticata. *Ceramidia* ovata, sæpius pedicellata, fasciculum sporarum pyriformium continentia. *Tetrasporæ* in ramulis vix mutatis nidulantes, uniseriatæ. Algæ in *mari frigidiori* sæpissime observatæ, fruticosæ, robustæ, cartilagineæ, fusco-purpureæ, siccitate nigrescentes.

The species of this genus, as now restricted, are characteristic of the higher latitudes of the Northern and Southern hemispheres. In the Northern Pacific they extend from the shores of arctic Asia and America, to those of California. In the Atlantic, from those of Iceland to France. None are found in the Mediterranean. They are generally coarser and more shrub-like plants than the *Polysiphoniæ,* but too closely linked in affinity to the inarticulate species of that genus, and to the *Alsidia* and *Rytiphlææ.*

1. Rhodomela Gaimardi, *Ag.*; fronde cylindracea flabellatim ramosissima, stipite simplici filiformi, ramis primariis divaricatis, secundariis patentibus bipinnatim multifidis segmentis alternis, ramulis brevibus setaceis simplicibus furcatis quadrifidisve sæpe secundis per totam frondem sparsis. *Hook. Fl. Antarc.* vol. ii. p. 481. t. 184. *Ag. Sp. Alg.* vol. i. p. 380. *Hook. fil. et Harv. in Lond. Journ.* vol. iv. p. 269.

Hab. Falkland Islands, *Gaudichaud*. Hermite Island, Cape Horn, and in Berkeley Sound, Falklands, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond as thick as bristle, 4–6 inches high, simple below, divided above into 3–4 principal branches; primary branches subdichotomous or irregular, again and again bifariously branched; secondary and tertiary branches long, subsimple, laxly set with short ramuli. *Ramuli* 2–3 lines long, frequently secund, very slender. *Colour* dark.

I have not seen any original specimen of this plant, but describe from specimens collected by Dr. Hooker in the locality that Gaudichaud visited. Agardh describes the frond as being *compressed*, a character resulting probably from irregular drying.

2. Rhodomela patula, *Hook. fil. et Harv.*; fronde cylindracea brunnea cellulis irregularibus notata vage bipinnatim ramosa, ramis alternis elongatis horizontalibus suberecto-patentibusve, minoribus elongatis patentibus subsimplicibus attenuatis nudis. *Hook. et Harv. in Lond Journ. Bot.* vol. iv. p. 264. *Hook. Fl. Antarc.* vol. ii. p. 481. t. 183. f. 2.

Hab. Port William and Berkeley Sound; Falkland Islands, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 4–6 inches long, half a line in diameter at base. *Stem* undivided, set with alternate, patent branches, 4–6 inches long, which in our specimens bear a second series. *Colour* dark brown. *Substance* membranaceous. The axis of the frond exhibits four large tubes surrounding a central one, with an external coating of small cellules.

Nearly related to the preceding, and possibly only a variety of it. This differs something in ramification, and in the absence of the numerous setaceous ramuli.

3. Rhodomela comosa, *Hook. fil. et Harv.*; ramosissima, atro-rubescens, caule cylindraceo frondem percurrente ramis crebris alternis ornato, ramis cylindraceis elongatis pluries alterne divisis erecto-patentibus sensim utrinque attenuatis ramulis ultimis setaceis acutis abbreviatis vagis, ceramidiis ovatis breve pedicellatis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 263. *Hook. Fl. Antarc.* vol. ii. p. 482. t. 185. (Tab. XI.)

Var. β. fronde tenuiori laxius ramosa, apicibus fibrilliferis.

Hab. Berkeley Sound, Falkland Islands, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Stem cylindrical, 6–9 inches long, in var. α, from half a line to nearly a line in diameter at base; in var. β, very slender, either undivided or branching from the base into three or four principal stems, which are thickly clothed with minor branches again and again similarly divided. All parts of the frond are opake, and outwardly inarticulate; but a section of the stem shows an articulated axis similar to that of many *Polysiphoniæ*, the central tube being surrounded by seven others, with a thick external stratum of smaller cells. *Colour* reddish brown. *Substance* flaccid and closely adhering to paper.

Tab. XI. Rhodomela comosa. Fig. 1. A frond:—*of the natural size.* 2. One of the smaller branchlets. 3. A ramulus with fibres. 4. Portion of a ramulus with ceramidia. 5. A ceramidium. 6. Transverse section of the frond.

4. Rhodomela glomerulata, *Mont.*; "fronde tereti filiformi siccitate longitrorsum striata ramosissima, ramis circumscriptione corymbosis iterum ramosis, ramentis lateralibus simplicibus aut bifidis corniformibus fasciculum sessilem stichidiorum oblongorum vel ovato-lanceolatorum sinu foventibus." *Mont. Bot. Voy. au Pole. Sud*, v. i. p. 141.

Hab. Auckland Islands, *D'Urville* (*v. s.* (*frustulum*) *in Herb. T. C. D. com. cl. Montagne.*)

Frond two inches long, thicker than pack-thread ("filum emporeticum"), preserving an equal thickness throughout, dark brown, branched from the very base. *Substance* cartilaginous, rigid.—*Mont.*

Distinguished, Dr. Montagne observes, by its peculiarly squarrose habit, the branches being set throughout with thorn-like ramuli.

5. Rhodomela (?) spinella, *Hook. et Harv.*; pusilla, cartilaginea, rigida, densissime cæspitosa, intricata, vagè ramosa, ramis elongatis patentissimis divaricatisve simplicibus furcatisve, ramulis spinæformibus subulatis acutis horizontalibus undique emissis, tetrasporis in ramorum majorum peripheria nidulantibus sparsis. *Hook. fil. et Harv. in Hook. Lond. Journ. Bot.* vol. iv. p. 534.

Hab. East coast of New Zealand, *Rev. Mr. Colenso.* Bay of Islands, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond from half an inch to an inch in height, setaceous, densely matted together into broad tufts, much and irregularly branched, rigid, brownish-red, turning black in drying; branches very patent, simple or forked, as long as the height of the frond, and more or less furnished with patent, spine-like ramuli, which issue at right angles and are frequently secund. *Tetraspores* scattered over the branches, immersed in the periphery. *Structure* a central tube surrounded by several concentric rows of endochromatic cells or tubes, which gradually become smaller outwards.

This little plant is somewhat anomalous in having its tetraspores scattered through the larger branches, a circumstance unique, as far as I am aware, among *Rhodomeleæ,* though frequent in *Sphærococcoideæ.* The structure of the frond is nevertheless similar to that of many *Rhodomeleæ.* Until the ceramidia be discovered, some doubt must rest on its generic affinities. The general habit is very similar to that of the West Indian *Gigartina spinella,* but the structure is widely different. There is also much resemblance to some depauperated forms of *Gelidium corneum,* especially the variety called *crinale.*

GENUS 17. TRIGENIA, *Sond.*

" *Frons* cartilaginea, filiformis, continua, subramosa, undique ramentis carnosis filiformibus simplicibus ramosisve obsessa. *Fructus*: *favellidia* (?) sphærica in ramentis inclusa. *Tetrasporæ* filis ramosis articulatis ramenta capsuligera vestientibus adnata."—*Sond.* *Ceramidia* globosa, membranaceo-cellulosa, fasciculum sporarum pyriformium includentia, in ramenta sessilia. Alga *australasica* robusta, fusco-rubra, ramulis filiformibus densissime onusta.

TRIGENIA australis, *Sond. in Bot. Zeit.* 1845. p. 54.

RHODOMELA vestita, *Harv. in Herb.* 1838.

HAB. Swan River Colony, *Mr. Backhouse*: *Preiss.* (*v. s. in Herb. T. C. D. com. cl. Backhouse; cl. Binder.*)

Frond (a broken specimen only seen) several inches in length, cylindrical, inarticulate, cartilagineo-corneous, nearly as thick as a goose-quill, irregularly branched; the branches and stem densely clothed in every part with simple, or forked, filiform ramenta, half an inch to nearly an inch in length, as thick as hog's bristle, cartilaginous and inarticulate. A transverse section of a ramulus shows a small central tube surrounded by four to five concentric rows of cells, each of which contains a bag of chromule; there are four cells in the inner row, eight in the next to it, sixteen to twenty in the third, and those of the fourth, which generally form the periphery, are very small and numerous. *Ceramidia* globose, membrano-cellular, pierced by a pore, sessile on the sides of the ramenta, sometimes terminal. *Colour* brown red.

The specimen I have described, which I received from Mr. Backhouse in 1838, is about four inches long, with two lateral branches, and is evidently a portion of a much larger plant. It produces *ceramidia*. The tetraspores I have not seen, and therefore think it right to give M. Sonder's generic character in full. I am indebted to Senator Binder for a fragment of Mr. Preiss's plant, which is in all respects similar to Mr. Backhouse's. The habit is very like that of the winter state of *Rhodomela lycopodioides*, or still more that of *Digenia simplex*, with which latter the structure of the frond nearly agrees; except that, in *Digenia*, the ramenta are jointed.

GENUS 8. POLYSIPHONIA, *Grev.*

Frons filiformis, ramosissima, articulata v. inferne plus minus inarticulata et areolata; ramuli saltem articulati, articulis longitudinaliter pluri-striatis, geniculis sæpissime hyalinis. *Caulis* è cellulis (*siphonibus*) pluribus cavitatem centralem (*axin*) radiatim cingentibus, uniseriatis, v. strato cellularum minorum pluriseriatarum circumdatis conflatus. *Ceramidia* ovata vel urceolata, sparsa, fasciculum sporarum pyriformium continentia. *Tetrasporæ* in ramulis ultimis uniseriatæ.—Genus vastissimum per mare boreale, tropicum et *australe* dispersum. Algæ habitu vario, rigidæ v. flaccidæ, cartilagineæ membranaceæ v. gelatinosæ, roseæ, purpureæ, badiæ v. nigrescentes sæpius ramosissimæ, rarò subsimplices. *Rami* dichotomi v. pinnati, distichi v. quadrifarii, ordinatim v. vagè divisi. *Apices* sæpissime fibrilliferi. *Ramuli* rarissime monosiphonii.

An immense genus, dispersed over the greater part of the explored ocean, from the Arctic circle to the borders of the Antarctic. The species vary greatly in general appearance, yet the whole form together such a natural assemblage that no one has ventured to divide the genus. Some are of large size, very robust and shrubby, rigid and cartilaginous; others are exceedingly flaccid and slender, and membranaceous or gelatinous. They vary as much in colour as in substance, some being of a fine crimson; several purple; others of a brownish red; and some of the coarser species scarcely less brown than the *Fuci* on which they grow. By far the greater number are parasitical, and while some occur indifferently on a great number of plants, others are confined to certain species. Those which grow on the larger *Fuceæ* appear to be more restricted in their habitats than the species which affect the *Florideæ*. Thus *P. fuliginosa* is only found on *Ecklonia buccinalis*, *P. fastigiata* on *Fucus nodosus*, &c., and it is remarkable that on these *Fuci* they are very generally developed. Many of the smaller species have their primary filaments decumbent, attached at intervals by means of small discs, analogous to the hold-fasts of Ivy, to the plants on which they grow; in these the secondary branches are usually erect; several, belonging to the sections *Dichotomæ* and *Pennatæ*, are of this character.

The species require a thorough revision, and rigid examination of the authentic specimens on which authors have founded them. Till this shall have been faithfully done we must fear that many false species exist in books. I shall here enumerate all the southern species which have, to my knowledge, been described, of most of which I have examined specimens; but it is out of my power to say whether some of them may not be found, under other names, in Northern Floras.

The genus has been divided by Professor J. Agardh into two great groups, distinguished by the comparative number of primary tubes or *siphons*, which surround the axis, and which may readily be counted by examining thin transverse slices under a lens. In the first group, *Oligosiphonia*, the central tube or axis is generally very narrow, surrounded by four, or very rarely five, large tubes, which either constitute the whole frond, or are coated with a stratum, of greater or less thickness, of smaller cellules in several rows. The second, *Polysiphonia*, includes all species whose stems contain six primary tubes or upwards. In these the central tube is sometimes wide, sometimes very narrow; the tubes vary from six to sixteen, or perhaps twenty; and there is in many a coating of external cells. To facilitate the study of the southern species I shall distribute them under sections, as follows:—

CONSPECTUS SPECIERUM.

SUBGENUS 1. OLIGOSIPHONIA.

Siphones primarii quatuor, rarissime quinque.

§ 1.—ELONGATÆ. *Caulis* opacus, inarticulatus. *Ramuli* articulati, tetrasiphonii. (Sp. 1–5.)

§ 2.—DICHOTOMÆ. Tota *frons* pellucide articulata, subdichotoma, decomposita. *Ramuli* tetrasiphonii. (Sp. 6–12.)

§ 3.—GLOMERULATÆ. Tota *frons* pellucide articulata, pinnata. *Rami* ramulis minutis multifidis tetrasiphoniis densissime velatis. (Sp. 13.)

§ 4.—CALLICOMÆ. Tota *frons* pellucide articulata. *Ramuli* monosiphonii, dichotomi. (Sp. 14.)

SUBGENUS 2. POLYSIPHONIA.

Siphones primarii sex vel plures. (Sp. 15–47.)

* *Frons* pellucide articulata. (Sp. 15–43.)

§ 5.—BYSSOIDEÆ. *Frons* alterne ramosa, ramellis dichotomis monosiphoniis obsita. (Sp. 15)

§ 6.—PUNICEÆ. *Siphones* 6–8. *Frons* punicea vage ramosa. *Ramuli* laterales dichotomi polysiphonii. (Sp. 16.)

§ 7. PENNATÆ. *Siphones* 12–16. *Frons* rosea v. purpurea sæpius disticha pinnatim composita. *Ramuli* simplicissimi, subulati, alterni, rarò quadrifarii, polysiphonii. (Sp. 17–26.)

§ 8.—CANCELLATÆ. *Siphones* sæpius 7, raro 8–9. *Frons* fusca, siccitate nigrescens, sulcata, fruticosa, vage ramosissima. *Ramuli* decompositi. (Sp. 27–32.)

§ 9.—ATRO-RUBESCENTES. *Siphones* 10–16 v. plures. *Frons* atro-rubens, siccitate obscurior, cylindracea, vagè v. pinnatim ramosa. *Ramuli* decompositi. (Sp. 33–43.)

* * *Frons* plus minus inarticulatæ.

§ 10.—FULIGINOSÆ. *Siphones* 12–16 v. plures. *Frons* badia, elata, basi inarticulata, apicem versus pellucide articulata. (Sp. 44–46.)

§ 11.—BOTRYOCARPÆ. *Siphones* 7. *Frons* rubra, siccitate fuscescens, elata, inarticulata, apicem versus spurie articulata, cellulis anastomosantibus. (Sp. 47.)

Subgenus 1. OLIGOSIPHONIA.

§ 1.—Elongatæ.

Caulis opacus inarticulatus. *Ramuli* articulati, tetrasiphonii.

1. **Polysiphonia** Hookeri, *Harv.*, fronde longissima crassa subindivisa inarticulata bi-tripinnata, pinnis pinnulisque alternis attenuatis distantibus ramulis minutis spinulosis bi-tri-multifidis apice fibrilliferis obsessis, ramulis solum articulatis, articulis diametro sesqui-longioribus bistriatis, ceramidiis urceolatis acuminatis sessilibus.
Polysiphonia acanthophora, *Harv. in Lond. Journ. Bot.* vol. iii. p. 441 (*not of Kütz.*)
(Tab. XII.)

Hab. Near George Town, Tasmania, *Mr. Gunn* (*v. s. in Herb. T. C. D. comm. cl. Hooker*).

Frond one to two feet long or more, cartilaginous, from a quarter to half a line in diameter below, gradually attenuated upwards to the thickness of a bristle, pinnated with patent branches, much more slender than the main stem, which gradually diminish in length from the lower part to the apex, so that the general outline of the frond is ovate. *Branches* once or twice pinnated; branches, pinnæ, and pinnulæ tapering to the base, inarticulate, closely beset with minute subquadrifarious ramuli, which in younger specimens are subsimple or forked, terminating in capillary, dichotomous, byssoid fibres; in full-grown fronds, multifid. Eventually the byssoid fibres fall off, leaving the tops of the ramuli truncate, and in this state fruit of both kinds is produced. *Ceramidia* urceolate, tapering to a subacute apex, sessile on the sides of the ramuli. *Tetraspores* immersed in distorted ramuli. *Articulations* only visible in the ramuli, bistriate, about as long or once and a half as long as broad. *Colour* a dark red-brown.

This is perhaps the noblest species of the genus. At different ages it varies very much in appearance, being, when young, soft and adhering to paper, and from the copious byssoid fibres that crown the ramuli, resembling a *Dasya* in general aspect. When old, it is extremely rigid and more like a *Sertularia*. Often the stem is spirally twisted like a geometrical staircase, as represented at fig. 2.

As the name under which I formerly described this species had been pre-occupied, I gladly avail myself of the opportunity thus afforded to dedicate it to my friend Dr. J. D. Hooker, to whose friendship I am indebted for a large portion of the plants described in this volume.

Tab. 11. **Polysiphonia Hookeri.** Fig. 1. Lower portion of a frond. 2. Spirally twisted variety of the same; small specimens:—*of the natural size.* 3. A young pinnule. 4. A fully grown pinnule. 5. A pinnule which has lost its byssoid fibres. 6. A ramulus. 7. A ramulus bearing tetraspores. 8. A tetraspore. 9. Portion of a pinnule, bearing ceramidia. 10. Tuft of spores from a ceramidium. 11. Spores. 12. Frustule of a smaller branch, to show the areolated surface. 13. Cross section of the stem. 14. Apex of a ramulus, with some of the byssoid fibres:—*more or less highly magnified.*

2. **Polysiphonia** Mallardiæ, *Harv.*, siccitate nigra, fronde elongata cartilaginea filiformi crassiuscula inarticulata pinnatim bipinnatimve ramosa, pinnis simplicibus elongatis,

pinnulis ramulis brevissimis densissime velatis, ramulis quadrifariis imbricatis dichotome multifidis obscure articulatis, articulis diametro equalibus, ceramidiis urceolatis acuminatis sessilibus. (TAB. XIII.)

RHODOMELA Mallardiæ, *Harv. in Lond. Journ. Bot.* vol. iv. p. 534.

HAB. Port Phillip, *Mrs. Capt. Mallard.* East coast of New Zealand, *Rev. Mr. Colenso* (*v. s. in Herb. T. C. D. comm. cl. Ward*; *cl. Hooker*).

Fronds six to eight inches long or more, as thick as packthread, branched with greater or less regularity in an alternately pinnate or bipinnate manner. The lower part of the stem and the bases of the branches are naked and smooth, but the upper portion, and all the branches and pinnulæ are densely clothed with short, quadrifarious, imbricated, multifid ramuli. These ramuli are about a line in length, rigid, patent or horizontal, irregularly dichotomous, and are the only parts of the frond which exhibit external joints. Joints as long as broad, bi-striate, with obscure dissepiments. *Colour*, in the dry state, intensely black. *Ceramidia* ovato-urceolate, with a slender protruding mouth, sessile on the ramuli, which are then thicker and less divided than usual. *Tetraspores* immersed in the scarcely distorted upper ramuli, in a single row.

I formerly referred this plant to *Rhodomela*, with which genus its inarticulate frond, and the change of colour well accords. I now remove it to *Polysiphonia*, on account of its very close affinity with the preceding and following species. It is named in compliment to Mrs. Capt. Mallard, its discoverer, who collected many interesting Algæ in a short visit to Port Phillip.

Tab. 13. POLYSIPHONIA MALLARDIÆ. Fig. 1. A frond:—*of the natural size*: 2. Portion of a pinnule, covered with ramuli. 3. A ramulus with ceramidium. 4. A cross section of the stem.

3. POLYSIPHONIA hystrix, *Hook, fil. et Harv.*, fronde setacea cartilaginea inarticulata vagè ramosa vel subdichotoma, ramis majoribus distantibus secundis alternisve longissimis arcuatis parum divisis, minoribus patentissimis similibus, omnibus per totam longitudinem ramulis multifidis onustis, ramulis articulatis brevissimis subulatis junioribus basi tantum spinulosis adultis glomerato-spinosissimis apiculatis, articulis diametro sublongioribus bi-striatis. (TAB. XIV.)

HAB. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

This species is nearly allied to *P. Hookeri*, but has a different aspect. Its main stems are scarcely thicker than the branches, and are very irregularly divided; the branches are long, far asunder, and remarkably arched; the ramuli are more compound, when fully grown, and have very generally their apex prolonged beyond the branching part, into a subulate acumination.

Tab. 14. POLYSIPHONIA HYSTRIX. Fig. 1. A frond:—*of the natural size.* 2. Part of a branch. 3, 4. Ramuli of different ages. 5. Ramellus with tetraspores. 6. A cross section of the stem.

4. POLYSIPHONIA Lyallii, *Hook. fil. et Harv.*, fronde elongata cartilaginea setacea inarticulata alterne vel vage ramosa, ramis elongatis simplicibus ramulis brevibus articulatis quadrifariis multifidis patentibus densissime vestitis, articulis diametro æquali-

bus. *Hook. fil. et Harv. in Fl. Antarct.* vol. i. p. 182. t. 74. f. 1. *Lond. Journ. Bot.* vol. iv. p. 268.

HAB. Lord Auckland's Islands, *Dr. Lyall* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*).

Stem erect, four to five inches long, ultra-setaceous, inarticulate, simple or divided below, furnished with more or less numerous lateral inarticulate branches throughout its length. *Branches* simple, of various lengths, quadrifarious, with or without a series of smaller branches, densely clothed with short multifid ramuli. *Ramuli* one to two lines long, quadrifarious, imbricate, patent, dichotomo-multifid, the lesser divisions subulate and patent. *Articulations* as long as, or a little longer than broad, visible only in the ramuli. *Stem* with four large tubes, and an external band of irregular cellules. *Colour* a brownish-red, becoming much darker in drying.

5. POLYSIPHONIA dumosa, *Hook. fil. et Harv.*, fronde (breviuscula) erecta rigida flabellatim ramosa inarticulata, ramis patentibus alternis v. subdichotomis ramulis brevibus squarrosis multifidis articulatis vix quadrifariis patentissimis laxe vestitis, articulis diametro æqualibus v. brevioribus. *Hook. fil. et Harv. in Fl. Antarct.* vol. i. p. 182. t. 75. f. 1. *Lond. Journ. Bot.* vol. iv. p. 268.

HAB. Campbell's Island, parasitical on the stems of the larger Algæ, *Dr. Hooker*, *Dr. Lyall*, *Mr. Davis* (*v. s. in Herb. T. C. D. comm. cl. Hooker*).

Fronds tufted, one to three inches long, erect, simple below, much branched in a broadly fan-shaped manner above, the branches simple or forked, more or less fastigiate, clothed throughout with very patent, squarrose, multifid ramuli, one to two lines in length, and about a line apart. *Ramuli* subdistichous or imperfectly quadrifarious, somewhat pinnate, the pinnules very much divaricate and subulate. *Colour* dark red-brown. *Substance* rigid. *Siphons* occasionally five, surrounded by a band of lesser cellules.

A smaller plant than *P. Lyallii*, more branched, of a duller colour and more rigid substance, with much less densely set, and more squarrose ramuli.

§ 2.—DICHOTOMÆ.

Tota *frons* pellucide articulata subdichotoma decomposite ramosa. *Ramuli* tetrasiphonii.

6. POLYSIPHONIA strictissima, *Hook. fil. et Harv.*, cæspitosa, atro-rubescens, frondibus elongatis capillaribus tenacibus strictis dichotomis, axillis angustissimis, ramis erectis fere appressis, articulis bi-striatis, inferioribus diametro 6–8-plo, mediis 5-plo, ultimis sesqui-subtriplo longioribus, apicibus fibrillosis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 538.

HAB. New Zealand, *M. Raoul* (*v. s. Herb. T. C. D. comm. ex. Mus. Paris, cl. Decaisne*).

Tufts four to five inches long, dense and coarse, dull dark red, consisting of dichotomous capillary fronds, all of whose divisions are remarkably straight and erect. I have not seen any fruit, and possibly the specimens are not fully grown.

7. POLYSIPHONIA microcarpa, *Hook. fil. et Harv.*, atro-rubescens, cæspitosa, frondibus tenuissimis capillaribus flaccidis tenacibus equalibus vix attenuatis irregulariter repetitim dichotomis, ramis ramulisque erecto-patentibus crebre divisis, articulis bi-striatis, inferioribus diametro multiplo, mediis triplo-quadruplove, ultimis sesqui duplove,

longioribus, ceramidiis pusillis ovatis breve pedicellatis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 265. *Fl. Antarct.* vol. ii. p. 479. t. 182. f. 3.

HAB. Hermite Island, Cape Horn, very rare, *Dr. Hooker*. Akaroa, New Zealand, *M. Raoul* (*v. s. Herb. T. C. D. comm. cl. Hooker, et ex Mus. Paris, Decaisne*).

Fronds tufted, three to four inches long, finer than human hair, flaccid, but not fragile, branched in an irregularly dichotomous manner from the base, of nearly equal diameter throughout. *Ceramidia* very small. *Colour* dark red.

Nearly related to the following, and also to *P. formosa*, Suhr, a native of the British seas, from which last it is readily distinguished by the different form and minute size of the ceramidia.

8. POLYSIPHONIA abscissa, *Hook. fil. et Harv.*, coccinea, frondibus circumscriptione ovatis tenuibus membranaceo-gelatinosis flaccidis tenacibus, caule primario parce diviso flexuoso ramos secundarios alternos multifidos circumscriptione obovatos emittente, ramis filiformibus, minoribus alternis subdichotomis, ramulis fastigiatis (quasi abscissis) fibrilliferis, articulis ramorum diametro quadruplo-sextuplo ramulorum duplo-triplove longioribus bi-striatis, ceramidiis pusillis ovatis breviter pedicellatis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 266. *Fl. Antarct.* vol. ii. p. 480.

HAB. Hermite Island, Cape Horn; dredged in about six fathom water, *Dr. Hooker* (*v. s. in Herb. T. C. D. comm. cl. Hooker*).

Fronds three to four inches long, purplish-red or crimson, alternately branched, the lower branches longest, the rest gradually shorter to the apex. *Branches* naked below, fastigiately branched above; the ultimate ramuli crowded, and level-topped, as if cut off with a shears.

Nearly related to *P. microcarpa*, but differently branched.

9. POLYSIPHONIA mollis, *Hook. fil. et Harv.* frondibus articulatis pellucidis basi setaceis mox capillaribus supra tenuissimis flaccidis gelatinosis, caule irregulariter dichotomo decomposite ramosissimo, ramis ramulisque gradatim tenuioribus erecto-patentibus, axillis acutis, ceramidiis numerosissimis ovatis, articulis bi-striatis inferioribus diametro æqualibus, mediis duplo-triplove, ultimis sesqui-subduplo longioribus.

HAB. Tasmania, parasitical on the larger Algæ, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Root scutate. *Fronds* erect, solitary, or approximating, but scarcely tufted, two to six inches high, setaceous at the very base, then capillary, and exceedingly slender above, much branched. Primary stem subdichotomous, but soon lost in the excessive division of the branches and ramuli, which are again and again decompounded in an irregularly dichotomous manner; the ultimate ramuli simple, elongate and erecto-patent, fibrilliferous, *Articulations* in the lower part of the stem very short, those of the principal divisions twice as long as broad, those of the smaller branches gradually shorter. The stem is formed of four large tubes surrounding a minute central cavity. *Ceramidia* very numerous, minute, shortly stalked, ovate, acute.

Allied to the Mediterranean *P. variegata*, but larger, coarser, and less cæspitose, with longer joints.

10. Polysiphonia incompta, *Harv.*, frondibus cæspitosis è filis repentibus ortis, caule setaceo articulato rigidiusculo vix attenuato basi longè simplici supra flabellatim ramoso dichotomo, ramis minoribus alternis crebris corymbosis multipartitis, articulis bi-striatis, primariis nodosis sesqui-longioribus, secundariis diametro equalibus, ultimis brevioribus.

Hab. On sand-covered rocks, on the shore near Muysenberg, Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds springing from decumbent, branching fibres, three to four inches (or probably more) in height, setaceous, rather rigid, not much attenuated, tufted, erect, simple for an inch or two above the base, afterwards irregularly dichotomous, repeatedly divided, the lesser divisions margined with alternate, many times dichotomous, fastigiate or corymbose branchlets; the whole frond with a flabellate outline. *Articulations* with swollen joints, bi-striate, those of the stem once and a half as long as broad, the rest gradually shorter. *Stem* composed of four large tubes, surrounding a minute central cavity. *Fruit* unknown. *Colour* a dark brown-red. *Substance* rather rigid, imperfectly adhering to paper.

My specimens of this are probably not fully grown, but they abundantly differ from any other southern species with which I am acquainted.

11. Polysiphonia rudis, *Hook. fil. et Harv.*, pusilla, frondibus è filis repentibus ortis cæspitosis rigidis tenacibus gracilibus subfastigiatis ramosis, ramis alternis apicem versus crebrioribus, inferioribus filiformibus nudis elongatis, superioribus basi nudis apice pinnatis, pinnulis subulatis elongatis erectis, articulis ramorum diametro 2–3-plo, ramulorum sesqui-longioribus bi-striatis. *Hook. fil. et Harv. Fl. Antarct.* vol. i. p. 183. t. 74. f. 2.

Hab. Lord Auckland's Islands, parasitic on other Algæ, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds densely tufted, springing from creeping fibres, one to one and a half inches long, rigid when dry, tenacious, dark brown, irregularly branched; lower branches erect, long, simple, filiform, naked; upper gradually shorter, naked below, pinnatifid above, pinnæ subulate, erect, the lowest longest. Circumscription of the branches obovate. *Articulations* with pellucid dissepiments, those of the branches twice or thrice as long as broad, of the ramuli once and a half as long. *Tetraspores* contained in the swollen apices of the ramuli, in a single row.

12. Polysiphonia implexa, *Hook. fil. et Harv.*, parvula, cæspitosa, implexa, frondibus è filis repentibus ortis brevibus vage ramosis, ramis alternis patentibus apice ramulos paucos emittentibus, ramulis subulatis patentibus sub-simplicibus, articulis inferioribus diametro sesqui-longioribus, superioribus equalibus. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 538.

Hab. New Zealand, *M. Raoul.* (*v. s. in Herb. T. C. D. comm., ex Mus. Paris, cl. Decaisne.*)

The specimens are about an inch in height, and seem to have formed wide, intricate patches on the surface of rocks. This species is allied to *P. intricata*, J. Ag., and several of the same section, but cannot be included under any described species known to me.

§ 3.—GLOMERULATÆ.

Tota *frons* pellucide articulata, sub-pinnata. *Rami* ramulis minutis multifidis tetrasiphoniis densissime velatis.

13. POLYSIPHONIA glomerulata, *Endl.*, fronde vage ramosa, ramis sparsis simpliciusculis pellucido-articulatis glomerulis ramulorum densissime obtectis, ramulis brevissimis multifidis spinosis, spinulis acutis, articulis omnibus bi-striatis, ramorum diametro sesqui-longioribus ramulorum diametro brevioribus. *Endl. Syn.* p. 46.

HUTCHINSIA glomerulata, *Ag. Sp. Alg.* vol. i. p. 102.

HAB. "Baie des Chiens Marins", New Holland, *Gaudichaud.* (*v. s. frustulum in Herb. T. C. D., ex Mus. Paris.*)

I have only seen a fragment of this plant, which seemingly has a habit not unlike that of *P. Mallardiæ,* but the stem is greatly more slender, and its structure abundantly different.

§ 4.—CALLICOMÆ.

Tota *frons* pellucide articulata. *Rami* monosiphonii, dichotomi.

14. POLYSIPHONIA (?) Callithamnion, *Sond.*, repens, minuta, fronde elongata simpliciuscula oligosiphonia ramulis obsessa alternis divaricato-dichotomis monosiphoniis, articulis primariis diametro sublongioribus, "stichidiis pedicellatis ovatis subrostratis." *Sond. in Bot. Zeit.*, 1845. p. 54.

HAB. Swan River Colony; parasitical on Corallines, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

A minute plant, a quarter to half an inch in length, with a subsimple (possibly becoming branched) pellucidly jointed stem, densely clothed with very patent, quadrifarious, imbricated, dichotomous ramuli. *Tubes* four, large, surrounding a rather wide central cavity. The fruit I have not seen.

This is perhaps, more strictly, a species of *Dasya.*

SUBGENUS 2. POLYSIPHONIA.

§ 5.—BYSSOIDEÆ.

Frons pellucide articulata, alterne ramosa, polysiphonia. *Ramuli* monosiphonii, dichotomi.

15. POLYSIPHONIA cladostephus, *Mont.*, fusco-purpurea, fronde setacea elongata alterne ramosissima, ramis majoribus decompositis, minoribus erectis longè simplicibus, omnibus ramellis monosiphoniis dichotomis roseis verticillatis imbricatis vestitis, apicibus ocellatis, articulis ramorum è tubis septem conflatis diametro duplo-triplove longioribus, superioribus sensim brevioribus, ceramidiis ovatis sessilibus, tetrasporis in ramulis distortis uni-seriatis. *Mont. Voy. au Pole Sud, Bot.* vol. i. p. 132. t. 13. f. 4. *a.*

POLYSIPHONIA byssoclados, *Harv. in Lond. Journ. Bot.* vol. iii. p. 436.

CLADOSTEPHUS australis, *Ag. Syst.* p. 169.

GRIFFITHSIA australis, *Ag. Sp. Alg.* vol. ii. p. 135.

BINDERA cladostephus, *Decaisne.*

HAB. New Holland, *Mus. Paris.* Lord Auckland's Islands, *D'Urville.* Very abundant in

Tasmania, parasitical on *Sargassa*, *Mr. Gunn*. New Zealand, *M. Raoul*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond six to eighteen inches long, thicker than hogs' bristle below, setaceous in the principal branches, distinctly jointed in every part, seven-tubed; the main branches naked at the base, irregularly divided, their upper part and all the lesser divisions densely whorled with single-tubed dichotomous ramelli, which spring from every joint, and are about a line in length. *Ceramidia* ovate, sessile on the branches at the base of the multifid ramelli. *Tetraspores* in the smaller branchlets. *Colour* a dull brownish-purple.

§ 6.—PUNICEÆ.

Siphones 6–8. *Frons* pellucide articulata, punicea vage ramosa. *Ramuli* laterales, breves, dichotomi, polysiphonii.

16. POLYSIPHONIA (Heterosiphonia) Berkeleyi, *Mont.*, punicea, fronde subdichotoma v. vage ramosa flexuosa, ramis alternis simplicibus v. iterum ramosis ramulis brevibus alternis dichotomo-multifidis patentibus lateralibus ornatis, articulis ramorum diametro-subtriplo longioribus, ramulorum subequalibus, ceramidiis sessilibus ovatis, stichidiis lanceolatis. *Hook. fil. Fl. Antarct.* vol. ii. p. 480.

HETEROSIPHONIA Berkeleyi, *Mont. Voy. au Pole Sud*, *Bot.* vol. i. p. 137. and POLYSIPHONIA punicea, *Mont. l. c.* p. 128. t. 5. f. 1. and 3.

Var. β. DAVISII; robustior, caule primario regulariter ramoso, ramis erecto-patentibus sub-bipinnatim ramosis, ramulis erectioribus densioribus parciusque divisis. POL. Davisii, *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 267.

HAB. Lord Anckland's Islands, *D'Urville*, *Hooker*. Straits of Magalhaens, *Mr. Darwin*. Hermite Island, Cape Horn, Falkland Islands, and Kerguelens' Land, abundant, *Dr. Hooker*, *Dr. Lyall*. β. Hermite Island, rare, *Mr. Davis*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond four to eight inches long, setaceous, very irregularly branched; sometimes with a percurrent undivided stem, pinnated with lateral branches, gradually diminishing upwards; sometimes subdichotomous; the branches usually flexuous or angularly bent, and all furnished with short, alternate, or spirally placed dichotomous ramuli, one to two lines long. In some varieties these are laxly, in others densely inserted, and different specimens vary much in the amount of division of the ramuli. Tubes of the stem eight (occasionally six?).

The var. β. has, at first sight, quite a different aspect, and I formerly regarded it as a distinct species. But after a very careful examination of numerous specimens, many of which present intermediate appearances, I have thought it best, with Dr. Hooker's concurrence, to consider it merely as a luxuriant variety. Dr. Hooker and I have examined an authentic specimen of *Heterosiphonia Berkeleyi*, and regard it as merely a faded and battered state of *P. punicea*, Mont.

§ 7.—PENNATÆ.

Siphones 12–16. *Frons* pellucide articulata, rosea v. purpurea, cartilaginea, v. flaccida, sæpius disticha, pinnatim composita. *Ramuli* simplicissimi, subulati, laterales, alterni, rarò quadrifarii, polysiphonii.

17. Polysiphonia dendroidea, *Mont.*, disticha, coccinea, fronde setacea compressa vage ramosa sub-tripinnata, pinnis inferioribus brevibus, superioribus gradatim longioribus magis compositis corymboso-fastigiatis, pinnulis subulatis alternis erecto-patentibus, articulis diametro triplo brevioribus multiseriatis. Pol. dendroidea, *Mont. in Orb. Voy. Crypt. Boliv.* p. 16. t. 5. f. 1.

Hab. Coast of Chili, *Gaudichaud.* (*v. s. in Herb. T. C. D. comm. cl. Arnott, cl. Hooker.*)

Fronds three to four inches long, thicker than hogs' bristle, much branched, all the divisions alternate and distichous. *Branches* very variable in length in different specimens, the smaller ones simply, the longer ones twice or thrice, pinnated; the upper usually longest and most compound. *Colour* a rosy-red, becoming brownish in drying. *Substance* rigid, imperfectly adhering to paper.

A very beautiful species, a good deal resembling the European *P. parasitica,* but much larger, more compound, and with shorter joints, &c. I have not seen Chilian specimens; those from which I have drawn my descriptions, were collected at Pisco, Peru, by Prof. Jameson, in the year 1822.

18. Polysiphonia dendritica, *Ag*? prona, ad algas majores applicita, pusilla, disticha, bipinnata, caule compresso pinnis creberrimis elongatis cum ramulis subulatis alternantibus ornato, pinnis iterum pinnulatis, pinnulis subulatis alterne majoribus ramulosis et minoribus simplicibus, articulis brevissimis multi-striatis, ceramidiis sæpe obliquis pinnulas terminantibus globoso-urceolatis ostiolo prominulo.

Hutchinsia dendritica, *Ag. Sp. Alg.* vol. i. p. 104? *Hook. et Harv. in Lond. Journ. Bot.* vol. iv. p. 536.

Hab. Parasitical on *Gedicium lucidum*; New Zealand, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*

Frond half an inch to an inch in length, lying flat on the surface of the *Gelidium,* attached to it by the whole length of its principal stem, all the branches being free. The general outline is ovate. *Stem* undivided, triply pinnate; pinnæ alternating with subulate ramuli, elongate, patent, bipinnate; the pinnules in like manner alternate with subulate ramuli. *Articulations* much shorter than broad, many-tubed.

I am not certain whether this be the plant of Agardh, whose specimens came from Brazil; and I have also feared to quote *Mont., Orb. Voy. Patag.* p. 6. t. 4. f. 3, whose figure, taken from Patagonian specimens differs from my plant in some respects. Possibly two or three species are confounded under this name.

19. Polysiphonia Heringii, *Harv.*, rosea, tenella, fronde unciali pellucida compressa articulata alterne ramosa, ramis simplicibus, distichis erecto-patentibus ramulis subulatis alternis onustis, articulis diametro equalibus multi-striatis, ramulorum diametro brevioribus, siphonibus 16, ceramidiis ovatis ramulos multifidos accessarios terminantibus.

Dasya tenella, *Hering ! in Ann. Nat. Hist.* vol. viii. p. 90.

Hab. Port Natal, South Africa, *Krauss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

Frond an inch high, compressed, undivided, set with lateral, subulate, alternate, flexuous, subdistichous ramuli, one issuing from almost every joint, and having a few alternate branches in its upper half. *Branches* simple, furnished like the main stem with subulate ramuli. *Ramuli* of equal length in all parts of the branch, erecto-patent, acute. *Ceramidia* borne on the tips of short, lateral branchlets, which issue from the main branches at the joint next above one of the ordinary ramuli, and at the same side of the stem, i. e., *supra-axillary*. *Tubes* sixteen, surrounding a wide, compressed, central tube. *Colour* rosy-red. *Substance* membranous.

Very nearly, perhaps too nearly, allied to *P. ceratoclada*, from which it is chiefly distinguished by its rather smaller size, and a difference in fructification; but for this latter character, I should not have ventured to separate it. Its base is unknown, and may afford another character.

20. Polysiphonia ceratoclada, *Mont.*, fronde è filo repente orta erecta compressa indivisa demum ramos alternos emittente, ramis patulis ramulis brevibus subulatis patentissimis alternis sparsis onustis, articulis diametro æqualibus v. sesquilongioribus, siphonibus 16, ceramidiis in ramulos insidentibus sessilibus v. brevissime pedicellatis ovatis. *Mont. Voy. au Pole Sud, Bot.* vol. i. p. 130. t. 5. f. 2. *Hook. fil. et Harv. Fl. Antarct.* vol. i. p. 183. t. 76. f. 2.

Hab. Parasitical on *Laurencia pinnatifida*, &c. Lord Auckland's Islands, *D'Urville*, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker*.)

Fronds rising from creeping filaments, erect, one to four inches high, compressed, at first simple, afterwards furnished with alternate, lateral branches. *Stem* and *branches* furnished throughout with alternate, frequent, subulate, very patent or recurved, acute ramuli. *Ceramidia* solitary, large, ovate, on the sides of the ramuli, sessile or very shortly stalked. *Colour* brownish-red. *Substance* rigid.

21. Polysiphonia Sulivanæ, *Hook. fil. et Harv.*, pusilla badia flaccida multistriata, fronde flabellatim ramosa, ramis alterne decompositis fastigiatis, ramulis sparsis alternis v. secundis subulatis simplicibus subquadrifariis, articulis ramorum diametro subduplo, ramulorum sesquilongioribus, siphonibus duodecim. *Hook. fil. et Harv. in Fl. Antarct.* vol. ii. p. 479. t. 182. f. 4.

Polysiphonia ceratoclada, β. *Hook. fil. et Harv. l. c.* vol. i. p. 183.

Hab. Falkland Islands, *Dr. Hooker*; *Mrs. Capt. Sulivan*. (*v. s. in Herb. T. C. D. comm. cl. Dna. Warren*.)

Fronds slender, one to two inches high, much branched. *Branches* alternate, once or twice similarly divided, emitting at almost every joint a subulate slender ramulus. *Ramuli* alternate or frequently secund, not quite distichous, patent, curved, those at the apex strongly incurved, falcate, or almost circinate. *Colour* brownish-red. *Substance* membranaceous.

Nearly related to *P. ceratoclada*, but more slender, and branching.

22. Polysiphonia versicolor, *Hook. fil. et Harv.*, majuscula, coccinea, madefacta aurea, fronde è filis repentibus orta ramosissma setacea parum attenuata, caule indiviso furcatove per totam longitudinem ramis lateralibus ramulisque subulatis onusto, ramis patentissimis simplicibus v. divisis, ramulis simplicibus subulatis subacutis patentibus alternis secundisve subdistichis, articulis diametro sesquilongioribus, siphonibus subdecem, ceramidiis infra apices ramulorum sessilibus ovatis. (Tab. XVI.)

25. **Polysiphonia** ericoides, *Harv.*; pusilla, fronde è filis repentibus orta erecta articulata parum ramosa ramulis subulatis simplicibus quadrifariis imbricatis densis vestita, ramis similibus, articulis diametro triplo brevioribus multistriatis, siphonibus 16, geniculis omnibus hyalinis.

Hab. Tasmania, parasitical on *Laurencia botryoides*, *Rev. Mr. Ewing*. (*v. s. in Herb. T. C. D., comm. cl. Gould.*)

Fronds springing from creeping fibres, one to two inches high, slightly branched, clothed throughout, except toward the very base, with densely set, quadrifarious, subulate, simple, imbricated ramuli about a line in length. *Branches* three or four, very erect, covered with ramuli, like the main stem. The whole frond is articulated, but the joints are extremely short, marked with eight striæ, separated by pellucid spaces. A cross section exhibits sixteen radiating tubes. *Colour* dark red-brown.

A very distinct species, allied to *P. ceratoclada*, but more robust, with far denser ramuli and shorter joints.

26. **Polysiphonia** prorepens, *Harv.*; minuta, fronde prona prorepente vage ramosa, ramulis erectis secundis è geniculo fere quoque egredientibus crassis compressis falcato-incurvis acutis basi angustatis, articulis diametro brevioribus ramulorum brevissimis multistriatis, tetrasporis in ramulis nidulantibus.

Hab. Algoa Bay, South Africa; creeping over the fronds of Corallines (*v. s. in Herb. T. C. D. comm. cl. Bowerbank.*)

Frond from a quarter of an inch to an inch or more in length, lying flat on the surface of the Coralline, to which it is attached at intervals by little discs which issue from the under surface, vaguely branched, jointed throughout, compressed laterally. From the upper side of nearly every joint springs a perfectly simple, falcate ramulus, about a line in length, acute, constricted at the base, jointed, and strongly compressed. Joints of the creeping filaments rather shorter than their breadth, of the ramuli twice or thrice as short, all about twelve-tubed. *Tetraspores* immersed in the slightly distorted ramuli, in a single row.

A curious and perfectly distinct little species, and apparently fully grown. I have not seen *ceramidia*, but many of the fronds produce tetraspores. The specimens, owing to exposure to the weather, have faded to a clear green; when fresh the colour is probably brownish-red.

§ 8. CANCELLATÆ.

Siphones 7–rarò 8–9. *Frons* pellucide articulata, fusca, siccitate nigrescens, sulcata, fruticosa, vagè ramosissima, cartilaginea. *Ramuli* decompositi. *Articuli* sæpius perbreves.

27. **Polysiphonia** decipiens, *Mont.*; nigrescens, caule crasso fruticoso virgato tereti sulcato articulato è basi ramosissimo, ramis virgatis erectis decompositis, ramulis lateralibus quadrifariis erecto-patentibus sensim attenuatis ultimis subulatis spinæformibus sparsis, articulis ramorum diametro quadruplo, ramulorum multoties brevioribus, siphonibus septem. Pol. decipiens, *Mont. Voy. Pole Sud, Bot.* vol. i. p. 131. *Hook. fil. Fl. Antarct.* vol. i. p. 184.

Polysiphonia rytiphlæoides, *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 537.

Hab. Parasitical on *Fuceæ*. Auckland Islands, *D'Urville*. New Zealand, *M. Raoul*. (*v. s. in Herb. T. C. D. comm. cl. Decaisne, ex Mus. Paris.*)

Frond four to six inches high, coarse, dark brown, becoming black, bushy. Joints of the stem and branches pellucid, but exceedingly short, so that the frond may be said to be closely transversely striate, rather than jointed. The branches are longitudinally furrowed, and composed of seven large tubes, surrounding a central cavity.

An authentic specimen, kindly communicated by Dr. Montagne, enables me with confidence to refer Dr. Hooker's and my *P. rytiphlæoides* to this place. The nearest affinity is with *P. cancellata,* but the branches are much more erect, and the joints shorter than in that species; and, on re-moistening, *P. decipiens* very rapidly decays, which is not the case with *P. cancellata.*

28. Polysiphonia cancellata, *Harv.*; siccitate fusco-nigrescens, caule crasso fruticoso tereti sulcato articulato è basi ramosissimo, ramis elongatis patentibus horizontalibusve curvatis iterum et iterum decompositè ramosissimis, ramulis tenuibus alternis pinnatis v. bipinnatis, ultimis subulatis spinæformibus sparsis, articulis inferioribus diametro triplo, superioribus duplo brevioribus cellulis quatuor latissimis notatis, siphonibus septem, ceramidiis parvis ovatis sessilibus. Pol. cancellata, *Harv. in Lond. Journ. Bot.* vol. iii. p. 440. (Tab. XV.)

Hab. Parasitical on *Fuceæ*, Tasmania, extremely common, *Mr. Gunn*, *Dr. Hooker*, *Rev. Mr. Ewing*, &c. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds very robust, as thick as pack-thread, four to five inches high, excessively branched and bushy; *branches* many times divided alternately, the main divisions spreading in all directions, forming a globose frond. Secondary branches much thinner than those they spring from, tapering to a fine point; furnished with ramuli greatly more slender than themselves. The joints are very short, marked with four wide colour cells, separated by broad pellucid spaces, so that the frond has a netted appearance, under a moderate lens. The stem is seven-tubed.

Tab. 15. Polysiphonia cancellata. Fig. 1. A frond:—*of the natural size.* 2. One of the smaller branches. 3. Fibrilliferous ramulus. 4. Ramulus with a *ceramidium.* 5. Portion of the main stem. 6. Transverse section:—*all magnified.*

29. Polysiphonia nigrita, *Sonder.*; siccitate nigra, caule crasso tereti sulcato articulato vage ramoso, ramis elongatis erecto-patentibus decomposite ramosissimis, ramulis crassiusculis, ultimis subulatis spinæformibus sparsis, articulis diametro sub-quadruplo brevioribus, siphonibus 8–9. Pol. nigrita, *Sond. Bot. Zeit.* 1845, p. 53.

Hab. Parasitical on Algæ. Swan River Colony, *Mr. Backhouse*, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Backhouse, cl. Binder.*)

Nearly related to *P. cancellata,* which it much resembles, but is more rigid, turning black in drying, and has a greater number of tubes in the main stem. In Preiss's specimen I find eight, as described by Sonder; and in Mr. Backhouse's, which does not othewise differ, nine tubes.

30. Polysiphonia frutex. *Harv.*; frondibus aggregatis fruticulosis ramosissimis articulatis sulcatis, caule setacea sensim attenuato è basi ramosissimo, ramis divaricato-patentibus iterum divisis, secundariis bipinnatis, pinnis distantibus patentibus, pinnulis brevibus spinæformibus patulis apice fibrilliferis, articulis diametro equalibus v. parum brevioribus, siphonibus septem. *Harv. in Lond. Journ. Bot.* vol. iii. p. 439.

Hab. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds two to four inches high, forming globose bushy tufts, branching in every direction; *stem* and *main branches* setaceous, nearly of equal diameter, repeatedly divided in an alternate manner. All the divisions patent or divaricate.

A more slender plant than *P. cancellata*, more densely tufted, with rather longer joints, and with less comparative difference in diameter between each successive series of branches.

31. Polysiphonia fuscescens, *Harv.*; frondibus aggregatis fruticosis ramosissimis articulatis sulcatis setaceis, ramis erectis elongatis attenuatis bi-tripinnatis, pinnis pinnulisque erecto-patentibus brevibus simplicibus v. ramulosis apice fibrilliferis, articulis ramorum diametro 2–4-plo longioribus, ramulorum æqualibus v. sesqui-longioribus, siphonibus septem. *Harv. in Lond. Journ. Bot.* vol. iii. p. 439.

Hab. Tasmania, *Mr. Gunn.* (*v. s. in Herb. Hooker.*)

Frond six to eight inches high, much branched, but not so shrub-like as *P. frutex*, divided from near the base into long erect primary branches, which are generally simple. These branches are, in circumscription, linear-lanceolate, closely bipinnate, pinnæ short, erect or erecto-patent, pinnulated with short simple spine-like ramuli, whose apices are beset with byssoid fibres. *Articulations* of the branches from two to four times longer than broad, those of the lesser divisions gradually shorter. *Tubes* seven.

Nearly related to the last, but more erect, and virgate, with longer joints.

32. Polysiphonia aterrima, *Hook. fil. et Harv.*; rigidula atra, fronde sulcata articulata basi nuda setacea sursum decomposite ramosissima sensim attenuata vix dichotoma, ramis alternis secundisve iterum alterne divisis circumscriptione obovatis, ramulis ultimis subulatis subsimplicibus distantibus erectis, axillis acutis, articulis omnibus brevissimis siphonibus novem decemve, ceramidiis ovato-globosis obtusissimis sessilibus sparsis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 536.

Hab. East coast of New Zealand, *Rev. Mr. Colenso.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds four to five inches long, setaceous, much branched, becoming intensely black in drying; branches alternate or irregular, repeatedly divided, the lesser divisions more and more erect. Joints evident in all parts of the frond, very short, composed of beautifully hexagonal, oblong cells. *Substance* rigid.

§ 9. Atro-rubescentes.

Siphones 10–16, v. plures. *Frons* pellucide articulata, atro-rubens, siccitate obscurior, cylindracea, vage vel pinnatim ramosa. *Ramuli* decompositi.

33. Polysiphonia flabelliformis, *Hook. fil. et Harv.*; pusilla, setacea, badia, rigidula,

fronde brevi basi simplici stipitiformi supra flabellatim ramosa, ramis irregulariter dichotomis multifidis subfastigiatis, ramulis ultimis erectis longe nudis, axillis angustis, articulis multistriatis inferioribus diametro multiplo superioribus sesquilongioribus. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 266. *Hook. Fl. Antarct.* vol. ii. p. 480. t. 183.

HAB. Crozet Islands, on *Macrocystis pyrifera*, *Dr. Hooker*. (*v. s. in Herb. Brit. Mus.*)

Frond, an inch high, solitary, rigid, as thick as hog's bristle, simple below, flabellately branched above, distichous. *Branches* multifid. *Articulations* of the branches very long, those of the ramuli gradually shorter.

34. POLYSIPHONIA tenuistriata, *Hook. fil. et Harv.*; rubescens, articulata, multistriata, frondibus gracillimis capillaceis flaccidis elongatis circumscriptione ovato-lanceolatis, caule primario subsimplici flexuoso alterne irregulariter dichotomo, ramis remotis circumscriptione ovatis, ramulisque erecto-patentibus sensim attenuatis apice fibrillosis, axillis acutis, articulis ramorum diametro multiplo, ramulorum duplo triplove longioribus, siphonibus duodecim tenuibus, geniculis incrassatis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 266. *Hook. Fl. Antarct.* vol. ii. p. 479.

HAB. Hermite Island, Cape Horn, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond four to six inches long, capillary, subsolitary (not tufted?), growing on the larger Algæ. Allied to *P. anisogona*, but much more slender, and not fragile when re-moistened.

35. POLYSIPHONIA anisogona, *Hook. fil. et Harv.*; atro-rubescens, flaccida, madore fragillima, frondibus cæspitosis irregulariter ramosissimis equalibus setaceis articulatis, ramis ramulisque alternis subdichotomisve erectis v. appressis, axillis angustissimis, articulis variis, inferioribus diametro sextuplo, superioribus duplo triplove longioribus, ultimis sesquilongioribus v. equalibus omnibus striis sex notatis, siphonibus duodecim. *Hook. fil. et Harv. in Lond. Journ.* vol. iv. p. 265. *Hook. Fl. Antarct.* vol. ii. p. 478. t. 182. f. 2.

HAB. Hermite Island, Cape Horn, and Falkland Islands, *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Tufts extremely dense, four to five inches high, intricate. *Articulations* varying much in length in different parts of the same filament.

Unfortunately from its extreme fragility, it is impossible to remove the specimens of this plant from the paper on which they have been dried, and our knowledge of its exact ramification is therefore imperfect. It is perhaps most nearly related to *P. atro-rubescens*, but the substance is very different.

36. POLYSIPHONIA atro-rubescens, *Grev.*; atro-rubescens, rigida, frondibus cæspitosis setaceis articulatis multistriatis subdichotomis, ramis alternis strictis erectis virgatis, ramulis sparsis v. subfasciculatis setaceis basi attenuatis erectis numerosis paucisve, articulis mediis diametro 2–4-plo longioribus superioribus inferioribusque sesquilongioribus, siphonibus 12–16 sæpius spiraliter curvatis, ceramidiis globosis subsessilibus, tetrasporis in ramulis multifidis nidulantibus. *Harv. in Hook. Br. Fl.* vol. ii. p. 331. *Hook. Fl. Antarct.* vol. ii. 478.

Polysiphonia Agardhiana, P. badia, and P. denudata, *Grev., et auct.*

Hab. Falkland Islands, not common, *Dr. Hooker.* Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds tufted, setaceous, six to ten inches long, much branched, rather rigid and crisp when recent, jointed throughout, irregularly dichotomous, the minor divisions alternate; all the branches very straight and erect. *Branches* long, with a second or third series; the penultimate branches virgate, set at intervals with a few scattered, or slightly tufted alternate, erect or close-pressed, awl-shaped ramuli. *Dissepiments* pellucid. Lower and upper articulations very short, those of the middle part of the branches two to four times as long as broad, marked with numerous striæ, which are separated by pellucid spaces, and generally spirally twisted.

The Falkland specimens are not fully grown, and some doubt may therefore attach to them; but those from the Cape of Good Hope, from which this description has been made, are identical with British ones. The species is abundant on the shores of Northern Europe.

37. Polysphonia fusco-rubescens, *Hook. fil. et Harv.*; atro-rubescens, rigidiuscula, multistriata, frondibus irregulariter dichotomis, caule angulatim flexuoso gracili sensim attenuato, ramis majoribus alternis striatis elongatis, ramulis paucis subulatis erecto-patentibus, axillis primariis patentibus secundariis acutis, articulis ramorum diametro duplo-triplo-quadroplove, ramulorum sesquilongioribus. *Hook. fil. et Harv. in Fl. Antarct.* vol. ii. p. 478. t. 182. f. 1.

Hab. Falkland Islands, *Mrs. Sulivan.* (*v. s. in Herb. Dnæ. Sulivan.*)

Fronds tufted, six to eight inches long, slender, naked below, much branched above; main divisions flexuous. Very nearly related to *P. atro-rubescens.*

38. Polysiphonia nigrescens, *Grev.*; fusca, rigidula, frondibus ultra-setaceis basi ramulis mutilatis asperatis supra ramosisimis, ramis alternis repetitim pinnatis circumscriptione obovatis, pinnulis distantibus elongatis subulatis alternis superioribus apice pinnulatis, articulis inferioribus brevibus superioribus sesquilongioribus, siphonibus sexdecim, ceramidiis ovatis sessilibus. *Harv. in Hook. Fl. Brit.* vol. ii. p. 332. *E. Bot.* t. 1743 and 1717.

Hab. New Zealand, *M. Raoul.* (*v. s. in Herb. Hooker.*)

Fronds six inches or more in height, robust and bushy, dark brown; the larger branches rigid, the smaller flaccid and tender. *Branches* somewhat distichous, repeatedly pinnate, the chief divisions with an obovate circumscription.

A common plant in the Northern Atlantic. M. Raoul's specimens are small, but they have all the essential marks of this variable species.

39. Polysiphonia corymbifera, *Ag.*; atro-rubescens, fronde setacea articulata multistriata dichotoma fastigiata basi rigidiuscula sursum flaccida attenuata, axillis inferioribus distantibus patentibus, ramis minoribus lateralibus multoties dichotomis corymbosis, articulis primariis diametro duplo-triplove longioribus secundariis sesquilongioribus, ultimis diametro æqualibus, siphonibus duodecim.

Hutchinsia corymbifera, *Ag. Sp. Alg.* vol. ii. p. 90.

Hab. Cape of Good Hope, *Agardh, Mus. Paris, W. H. H.* (*v. s. in Herb. T. C. D.*)

Fronds laxly tufted, six to eight inches long, setaceous, gradually attenuated, many times dichotomous, the lower axils patent and distant from each other; the upper branches alternately divided, and furnished at intervals with short, lateral, alternate branchlets, from a quarter to half an inch in length, obovate or corymbose in outline, and divided dichotomously into numerous ramuli. *Articulations* of the main stem two to three times as long as broad, those of the branches shorter, and the ultimate joints shorter than their breadth. *Tubes* twelve, with a small central tube, hyaline cases and dissepiments. *Colour* a dark brownish-red. *Tetraspores*, in distorted ramuli.

The lateral, corymbose branches afford the best mark of this species.

40. POLYSIPHONIA urbana, *Harv.*; dense cæspitosa, fusco-rubra, frondibus capillaribus articulatis multistriatis flaccidis subgelatinosis ramosissimis, ramis primariis dichotomis secundariis alternis sensim attenuatis patentibus multipartitis, penultimis basi longe nudis apicem versus multifidis, ramulis basi attenuatis fibrilliferis erectis multifidis, articulis primariis diametro 6–10-plo, secundariis 2–3-plo longioribus, supremis æqualibus v. brevioribus, siphonibus decem, tetrasporis in ramulis nidulantibus.

HAB. Table Bay, Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds four to six inches long, densely tufted, capillary, excessively branched, very flaccid and subgelatinous; the main divisions somewhat dichotomous, the secondary branches alternate, very many times divided in a similar manner, the penultimate divisions naked for half their length, furnished with ramuli above, which give the plant, to the naked eye, the appearance of having tufts of ramuli at the apices. Joints of the main filaments very long, those of the lesser divisions gradually shorter. It closely adheres to paper.

A much more slender and flaccid plant than *P. corymbifera*, with longer joints, composed of fewer tubes. The aspect is not unlike *P. fibrata*, but the structure is widely different.

41. POLYSIPHONIA arenaria, *Harv.*; frondibus dense cæspitosis è filis repentibus ortis capillo tenuioribus ramosissimis intricatis ramis crebre dichotomis sensim attenuatis, axillis patentibus, articulis primariis diametro triplo, secundariis sesqui-duplo-longioribus supremis diametro brevioribus, siphonibus decem, tetrasporis in ramulis nidulantibus.

HAB. Cape of Good Hope, at Houts Bay, and on the shore near Muysenberg; on sand-covered rocks, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds two to three inches high, densely tufted, springing from a mass of creeping fibres, very slender and flaccid, excessively branched. *Branches* dichotomous, more and more frequently divided upwards, without distinct lateral branches.

Allied to the last species, but a much smaller plant, with shorter joints and without the corymbose lateral branches.

42. POLYSIPHONIA tenebrosa, *Harv.*; nigrescens, cæspitosa, è filis repentibus orta, fronde setacea rigida articulata multistriata subsimplici basi nudiuscula v. ramulis paucis subulatis obsessa, supra plus minus ramosa, ramis alternis brevibus circumscriptione obovatis basi ramulis brevibus subulatis apicem versus ramulis multifidis onustis, articulis diametro brevioribus multistriatis, siphonibus duodecim.

HAB. On sand-covered rocks, on the shore near Muysenberg, Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds densely tufted, two to three inches high, sparingly branched, setaceous, rigid, *Stems* bare of branches for three fourths of their length, and either nearly naked, or set with short, alternate, awl-shaped, simple ramuli; branched above. *Branches* three to four, short, erecto-patent, clothed with alternate simple ramuli in their lower half, but with larger, compound ramuli above. Joints very short in all parts of the frond. *Colour* very dark.

A small, but coarse growing species, allied to *P. opaca.*

43. POLYSIPHONIA monocarpa, *Mont.*; "parvula, filis brevissimis ($1\frac{1}{2}$ lin.) capillaribus subsimplicibus attenuato-subulatis miniatis, articulis diametro subæqualibus striis quinque notatis; capsula ovata acuminata in medio fili breviter pedicellata, sphærosporis in individuis diversis." *Mont. Ann. Sc. Nat.* vol. xviii. p. 254. *Voy. Bonite,* t. 2. f. 3.

HAB. On the larger *Fuci* at the Cape of Good Hope, *Gaudichaud.* (*v. s. in Herb. T. C. D. comm. cl. Montagne.*)

§ 10. FULIGINOSÆ.

Siphones 12–16 v. plures. *Frons* badia, elata, caule inarticulato, ramis minoribus pellucide articulatis.

44. POLYSIPHONIA fuliginosa, *Rud.*; caule ultra-setaceo compresso longissimo opaco inarticulato alterne ramoso, ramis virgatis bi-tripinnatis, pinnis pinnulisque articulatis alternis, ramulis dichotomo-multifidis, axillis acutis, articulis diametro equalibus octo-striatis, geniculis pellucidis, siphonibus 16. *Rud. in Linnæa.*

HUTCHINSIA complanata, *Ag. Sp. Alg.* vol. ii. p. 59.

CERAMIUM fuliginosum, *Mert.*

HAB. On the stems of *Ecklonia buccinalis,* at the Cape of Good Hope; very common. (*v. v. et s. in Herb. T. C. D.*)

Root scutate. *Fronds* twelve to twenty inches long, twice as thick as hog's bristle below, where they are compressed, becoming more slender, and more cylindrical upwards, inarticulate, opake, simple or once or twice forked below, furnished throughout with long, virgate quadrifarious branches. Main branches six to twelve inches long, simple, furnished with lateral branchlets or pinnæ, one to three inches long, patent, jointed. These secondaries are furnished, in like manner, with a tertiary set, from a quarter to half an inch long, and simple or alternately branched. Joints as long as broad, wherever they are visible. A transverse section of the stem or of one of the larger branches shows a central tube, surrounded by a broad belt of small, irregular cells, in many rows, round which sixteen tubes radiate in an elliptic curve; and outside these extends another broad belt of cellular tissue. A section of one of the lesser branches shows the central tube surrounded by sixteen others, without any intervening cellular belt, and with a very narrow external cellular coat; and a section of ramulus presents simply the central tube, with its sixteen primaries. *Tetraspores* are formed in accessory, dichotomous ramuli situate in the axils of the penultimate branchlets. *Ceramidia* I have not seen. *Colour*, a dark reddish-brown. *Substance* cartilaginous, soon decomposing in fresh water.

45. POLISIPHONIA virgata, *Ag.*; "filis teretibus crassis sursum attenuatis atro-purpureis continuis virgato-pinnatis, ramis articulatis, articulis diametro equalibus." *Sp. Alg.* vol. ii. p. 60. (HUTCHINSIA)

HAB. Cape of Good Hope, *Gaudichaud.*

This plant I have not seen.

§ 11. BOTRYOCARPÆ.

Siphones 7. *Frons* rubra, siccitate fuscescens, elata, inarticulata, ramulis spuriè articulatis cellulis anastomosantibus corticatis.

47. POLYSIPHONIA botryocarpa, *Hook. fil. et Harv.*; caule inarticulato valido elongato flexuoso, ramis alterne ramosissimis, ramulis erecto-patentibus alternis secundisve sensim attenuatis ultimis subulatis articulatis, articulis multistriatis diametro æqualibus, ceramidiis minutissimis ovatis in glomerulis parvis pedicellatis densissime congestis, stichidiis lanceolatis, siphonibus septem strato cellularum circumdatis. *Hook. fil. et Harv. in Fl. Antarct.* vol. i. p. 181. t. 70.

RHODOMELA Gaimardi, *Mont. Voy. au Pole Sud, Bot. Crypt.* p. 140. (*excl. syn.*)

HAB. Akaroa, and Lord Auckland's Islands, *D'Urville, Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Stem eight to fourteen inches long, half a line in diameter at the base, much attenuated upwards, cartilaginous, reticulated with anastomosing veins, flexuous or bent in a zigzag manner, furnished with lateral branches; branches alternate, resembling the stem, decompound. *Colour* a dark, dull red, becoming brown in drying. *Ceramidia* very minute, densely crowded in small tufts.

A fine species, robust and of large size, with a good deal the habit of the northern *P. elongata,* but essentially different, besides other characters, in the number of primary siphons. The figure in the 'Flora Antarctica' is of too bright a colour.

GENUS 19. DASYA, *Ag.*

Frons filiformis v. compresso-plana, linearis, ramosa, inarticulata, v. plus minus articulata, articulis longitudinaliter pluristriatis, ramellos *monosiphonios* dichotomos simplicesve emittens. *Caulis* è cellulis (*siphones*) pluribus cavitatem centralem radiatim cingentibus sæpius strato celluloso corticatis conflatus. *Ceramidia* ovata v. urceolata, sæpissimè pedicellata.. *Stichidia* lanceolata, è ramellis enata, tetrasporas duplici multiplicive serie foventia. Algæ fruticosæ, habitu vario, *boreales, tropicæ* et *australes,* roseæ, purpureæ v. raró badiæ, ramellis sæpè penicellatis, gracillimis, flaccidis, plus minus vestitæ; stichidiis elegantissimis.

This beautiful genus, founded in 1824, on the Mediterranean *Dasya elegans,* now contains thirty described species, which are widely distributed over the Ocean, from the north of Europe to Cape Horn. In Northern Europe two species occur; the south coast of England, and in Ireland, a third makes its appearance; the Atlantic shores of Spain furnish two more, and the Mediterranean Sea, besides two of the former, produces five species, which do not elsewhere occur in Europe. *Dasya*

elegans, the type of the genus, abounds also on the shores of Rhode Island, in North America, and is closely represented by the *D. villosa* of the Southern Hemisphere. *Dasya coccinea*, the most northern species, is found on all the Atlantic shores of Europe, and in North America, but does not exist in the Mediterranean; this also has its tropical analogue in *D. crassa*, and its southern in *D. ceramioides*. *Dasya arbuscula*, the other north of Europe form, which extends from the Orkneys to the shores of Senegambia, is very closely, perhaps too closely, allied to the Cape of Good Hope *D. scoparia*. In like manner the *Dasya spinella* of the Mediterranean, is allied to the tropical *D. acanthophora*; and *Dasya pectinata* of Cape Horn, to the Chilian *D. subsecunda*, and the South African *D. pellucida*. One group of the genus, represented by *D. Gunniana*, has no northern representative; and another, that of *D. bolbochæte*, unless the tropical *D. trichoclados* may associate with it, is also exclusively southern. This last group is perhaps more properly a separate genus.

The genus *Dasya* may be divided into five natural groups, or subgenera, which I shall here characterize, enumerating under each, the species which belong to it.

I.—COMPSOTEIA. *Frons* plus minus articulata, polysiphonia, coccinea, pinnato-dichotoma, ramis minoribus in ramellos dichotomos monosiphonios apice solutis.

1. *D. Gunniana*, Harv. 2. *D. Lawrenciana*, Harv. 3. *D. capillaris*, Hook. et Harv.

II.—DASYOPSIS. *Frons* inarticulata, plus minus compressa v. applanata, ramulis spinæformibus ramellos penicillatos dichotomos monosiphonios apice emittentibus ornata.

4. *D. plana*, Ag. 5. *D. cervicornis*, J. Ag. 6. *D. spinella*, Ag. 7. *D. acanthophora*, Mont.

III.—RHODONEMA. *Frons* inarticulata, cylindracea, vage ramosa, ramis ramulisque plus minus ramellis dichotomis monosiphoniis quadrifariis vestitis.

8. *D. elegans*, Ag. 9. *D. sanguinea*, Mont. 10. *D. villosa*, Harv. 11. *D. punicea*, Menegh. 12. *D. arbuscula*, Ag. 13. *D. collabens*, Hook. fil. et Harv. 14. *D. scoparia*, Harv. 15. *D. ocellata*, Harv. 16. *D. corymbifera*, J. Ag. 17. *D. velutina*, Sond. 18. *D. elongata*, Sond. 19. *D. naccarioides*, Harv. 20. *D. lophoclados*, Mont.

IV. LOPHOTHALIA. *Frons* articulata v. inarticulata, tetrasiphonia, virgata, alterne ramosa, purpurea, nuda v. ramellis simplicissimis monosiphoniis verticillatis vestita. *Stichidia* è ramis enata, ramellis vestita (*An genus propium?*).

21. *D. bolbochæte*, Harv. 22. *D. verticillata*, Harv. 23? *D. trichoclados*, J. Ag.

V. STICHOCARPUS. *Frons* plus minus articulata polysiphonia, coccinea, decomposite pinnata, sæpissime disticha, pinnulis ultimis (*ramelli*) monosiphoniis simplicissimis, subulatis.

24. *D. coccinea*, Ag. 25. *D. crassa*, J. Ag. 26. *D. hormoclados*, J. Ag. 27. *D. ceramioides*, Harv. 28. *D. pectinata*, Hook. fil. et Harv. 29. *D. subsecunda*, Suhr. 30. *D. pellucida*, Harv.

The following table shows the geographical distribution of the known species; those which occur in more than one region being printed in italics:—

Northern Atlantic.	Mediterranean.	Tropical Atlantic.	Pacific.	Antarctic Sea, Cape Horn, &c.	South Africa, Australia and New Zealand.
D. cervicornis.	D. plana.	D. acanthophora.	(*Chili.*)	D. pectinata.	(*Australia.*)
— *elegans.*	— spinella.	— *arbuscula.*	D. subsecunda.		D. Gunniana.
— *arbuscula.*	— *elegans.*	— lophoclados.			— Lawrenciana.
— *ocellata.*	— sanguinea.	— trichoclados.			— capillaris.
— corymbifera.	— punicea.	— crassa.			— villosa.
— coccinea.	— *arbuscula.*				— velutina.
	— *ocellata.*				— elongata.
					— naccarioides.
					— bolbochæte.
					— verticillata.
					— hormoclados.
					— ceramioides.
					(*New Zealand.*)
					D. collabens.
					(*South Africa.*)
					D. scoparia.
					— pellucida.

Species excluded from the genus.

Dasya spongiosa, Ag. —— *Callithamnion arbuscula*, Lyngb.
Dasya tenella, Hering. —— *Polysiphonia Heringii*, Harv.
Dasya pallida, Sond. —— a *Wrangelia*; allied to *W. nobilis*, Hook. fil. et Harv.
Dasya crispa, Suhr. —— *Bostrychia.*

SUBGENUS 1. COMPSOTEIA, *Harv.*

1. **DASYA (COMPSOTEIA) Gunniana, *Harv.***; caule longissimo crasso basi inarticulato striato alterne ramoso, ramis primariis elongatis distantibus articulatis, secundariis pinnatis bi-pinnatisve, pinnis pinnulisque alternis dichotomè multifidis roseis flabellatis fastigiatis, ramulis sensim attenuatis ultimis in fila byssoidea monosiphonia rosea dichotoma solutis, articulis inferioribus diametro sesqui, superioribus duplo-triplove longioribus, ceramidiis (magnis) globosis sub-sessilibus, stichidiisque lanceolatis acuminatis pedicellatis apicem versus ramulorum minorum. (TAB. XVII.)

POLYSIPHONIA Gunniana, *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 437.

HAB. George Town, Tasmania, *R. Gunn, Esq* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*).

Frond eight to twelve inches long, or more, from half a line to nearly a line in diameter below, attenuated upwards, flexuous, repeatedly and at length excessively branched, opake and inarticulate below, more or less distinctly jointed above. *Branches* alternate, patent, long, flexuous, the larger ones bi-pinnate, the smaller simply pinnate. *Pinnæ* and *pinnulæ* with a fan-like outline regularly circumscribed, many times dichotomous, the divisions gradually tapering to fine points; many-tubed in their lower part, becoming less and less compound toward their apices, and ending in single-tubed, dichotomous filaments. *Substance* tender, closely adhering to paper. *Colour* a brilliant rosy-red. *Ceramidia* very large, at first ovate, afterwards nearly globose; seated below the terminal filaments. *Sti-*

chidia lanceolate-acuminate, stalked, borne near the apices of the polysiphonous part of the frond.

A very noble species, beautiful even in a dried state, but which must be magnificent when waving its long branches, fringed with pencils of rosy filaments, freely in the water. I have great pleasure in inscribing it to its discoverer, Mr. Gunn, of Launceston, Tasmania, by whose zeal our acquaintance with the botany of that colony has been greatly extended.

Tab. 17. DASYA GUNNIANA. Fig. 1. A portion of a frond:—*of the natural size.* 2. Part of a branch, with a small pinna. 3. Apex of a pinnule, with stichidia and terminal filaments. 4. A ceramidium. 5. A transverse section of the stem.

2. DASYA (COMPSOTEIA) Lawrenciana, *Harv.*; caule longissimo crasso inarticulato striato alterne pluries ramoso, ramis primariis secundariis tertiariisque pinnatis, pinnis alternis dichotomè multifidis roseis congestis fastigiatis, ramulis parum attenuatis ultimis in fila monosiphonia rosea dichotoma solutis, articulis ramulorum diametro æqualibus, filorum sesqui-duplo longioribus, stichidiis lanceolatis subsessilibus apicem versus ramulorum minorum. (TAB. XVIII.)

POLYSIPHONIA Laurenciana, *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 438.

HAB. George Town, Tasmania, *R. Gunn, Esq.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond eight to ten inches long, or more, half a line in diameter below, setaceous above, many times alternately branched. *Branches* of the first, second, and third series all inarticulate; the penultimate dichotomous ramuli alone showing external joints. *Ramuli* terminating in single-tubed dichotomous filaments. *Substance* cartilaginous, firm. *Colour* a firm crimson.

Nearly related to *D. Gunniana*, but a smaller and less showy plant, much more opake and dense in structure, firmer in substance, adhering less closely to paper, with shorter joints, which are only visible in the younger part of the frond. It is dedicated to the memory of the late R. W. Lawrence, Esq., the intimate friend and accomplished fellow-labourer in botany of Mr. Gunn.

Tab. 18. DASYA LAWRENCIANA. Fig. 1. A plant:—*of the natural size.* 2. Part of a branch, with a small pinna. 3. Apex of a pinnule, with stichidia and terminal filaments. 4. A ceramidium. 5. A transverse section of a small branch. 6. A section of the stem.

3. DASYA (COMPSOTEIA) capillaris, *Hook. fil. et Harv.*; punicea, cæspitosa, caulibus capillaribus intricatis perflaccidis sensim attenuatis decomposite ramosis, ramis primariis basi inarticulatis pluries alterne ramosis, ramulis multifidis in fila arachnoidea tenuissima monosiphonia longissima dichotoma desinentibus, articulis ramorum diametro 3–5-plo, ramellorum multiplo longioribus, stichidiis pedicellatis lanceolatis attenuatis. (TAB. XIX.)

HAB. Tasmania; parasitical on other Algæ, *Mr. Gunn.* (*v. s. in Herb. T. C. D, comm. cl. Hooker.*)

Frond four to eight inches long, nearly as thick as hog's bristle at the base, but soon attenuated, becoming much more slender than the human hair in its lesser divisions, and

gradually passing above into a cobwebby fineness, exceedingly flaccid and most closely adhering to paper. *Stem* densely tufted, and in our specimens, inextricable, their exact ramification is therefore at present undetermined. Lesser divisions irregularly dichotomous, set with lateral ramuli which terminate in dichotomous byssoid single-tubed filaments. *Stems* inarticulate below; but all the branches are distinctly jointed, like those of a *Polysiphonia*, four striate (composed of eight tubes), the joints being three to five times longer than broad. *Stichidia* stalked, lanceolate, tapering into a fine point, and frequently terminating in a long byssoid filament. *Colour* a fine purplish crimson well preserved in drying.

This is a much smaller and more delicate plant than either of the preceding, with the external appearance of *Callithamnion*, rather than a *Dasya*. The joints in all parts of the frond are longer, the stichidia more attenuated, and the colour brighter. The ceramidia are not known.

Tab. 19. DASYA CAPILLARIS. Fig. 1. A tuft:—*of the natural size.* 2. Portion of a branch, with the base of a ramulus, and some of the dichotomous filaments, bearing stichidia. 3. A stichidium. 4. A tetraspore.

SUBGENUS 2. RHODONEMA, *Mert.*

4. DASYA (RHODONEMA) villosa, *Harv.*; caule crasso longissimo alterne ramosissimo cartilagineo, ramis virgatis iterum divisis crebris erecto-patentibus ramellis quadrifariis floccosis monosiphoniis articulatis dichotomis flaccidis purpureis densissime vestitis, articulis filorum diametro 4–5-plo longioribus, stichidiis pedicellatis oblongis mucronatis, ceramidiis ovato-urceolatis pedicellatis. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 433. (TAB. XX.)

HAB. George Town, Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond twelve to fourteen inches long, excessively branched and bushy, many times divided, alternately. *Branches* crowded; they and all parts of the frond, except the older portions of the stem, densely clothed with exceedingly slender quadrifarious articulated dichotomous filaments or ramelli. These are neither whorled nor pencilled, but, though crowded, are irregularly scattered over the surface; they are two to four lines long, repeatedly, but distantly, dichotomous, with acute axils and joints four to five times longer than broad. The *colour* is a dark vinous red, becoming brownish in drying. *Ceramidia* springing from the stem, on thickish inarticulate pedicels, urn-shaped, with a slender protruding mouth; *stichidia* borne on the ramelli, oblong, more or less acute or mucronate, but not attenuate.

This species is nearly allied to *D. elegans*, Ag., but is a much coarser growing plant, much less impatient of fresh water, and wants the beautiful rosy colour of that species.

Tab. 20. DASYA VILLOSA. Fig. 1. Portion of a frond:—*of the natural size.* 2. Apex of a branch, covered with ramelli, and bearing stichidia. 3. Section of a branch, with one of the fibres, partly shown. 4. A stichidium. 5. Portion of a branch with ceramidia. 6. A ceramidium:—*all more or less magnified.*

5. DASYA (RHODONEMA) collabens, *Hook. fil. et Harv.*; caule tereti inarticulato flaccido glabro alterne ramoso, ramis subdistichis erecto-patentibus simplicibus iterumve

divisis ramellis articulatis monosiphoniis dichotomis laxe vestitis, ramellis patentissimis basi crassiusculis sensim attenuatis acutissimis bis terve furcatis, articulis diametro 2–3-plo longioribus ad genicula contractis. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. iv. p. 535. (TAB. XXI.)

HAB. Akaroa, New Zealand, *M. Raoul.* (*v. s. in Herb. T. C. D. comm. cl. Decaisne, ex Mus. Paris.*)

Fronds two to four inches high, rather thicker than a bristle below, gradually attenuated upwards, undivided, but well furnished with alternate lateral branches, which are nearly distichous, and, like the stem, quite opake and inarticulate. These are simple, or furnished with a second or third series of minor branches, and all are laxly clothed with very patent dichotomous ramelli. *Ramelli* twice or thrice forked, their ultimate divisions elongate, subulate, tapering to an acute point. *Substance* very tender and flaccid, closely adhering to paper. *Colour* rosy red. A transverse section of the stem shows five large radiant tubes.

This is nearly related to *D. arbuscula*, but is a more slender plant, and much more flaccid and gelatinous; and is essentially distinguished by the divisions of the ramelli tapering to an acute point.

Tab. 21. DASYA COLLABENS. Fig. 1. A tuft:—*of the natural size.* 2. Portion of a branch, clothed with ramelli. 3. A ramellus. 4. A cross section of the stem:—*all more or less highly magnified.*

6. DASYA (RHODONEMA) scoparia, *Harv.*; caule fruticoso cartilagineo inarticulato crasso basi nudo vage ramoso, ramis subquadrifariis iterum divisis ramellis articulatis monosiphoniis dichotomis densissime vestitis ramellis quadrifariis imbricatis erectis incurvis vix attenuatis subacutis, articulis diametro 2–3-plo longioribus, stichidiis parvis breve pedicellatis lanceolatis acuminatis. *Harv. MSS. J. Ag. in Linnæa*, vol. xv. p. 34. *Endl. Syn.* p. 44. (TAB. XXI.)

HAB. On rocks, near low-water mark. At Green Point, near Cape of Good Hope, *W. H. H.* Port Natal, *Krauss in Herb. Binder.* (*v. v. et s. in Herb. T. C. D.*)

Stems two to four inches high, subsimple, as thick as a sparrow's quill, opake and inarticulate, naked below, alternately branched above, shrub-like; the branches quadrifarious, simple, or again divided, densely clothed, as well as the upper part of the stem, with single-tubed ramelli, one to two lines long. *Ramelli* imbricated, twice or thrice dichotomous, their ultimate divisions long, falcate, incurved, subacute; their joints twice or thrice as long as broad. *Stichidia* minute, lanceolate, gradually acuminate, containing a double row of large tetraspores. *Colour* a dark brown-red. *Substance* rather rigid, imperfectly adhering to paper.

This species closely represents the northern *D. arbuscula*, but is a much coarser plant, shaggy, and rigid, very imperfectly adhering to paper. The joints in the ramelli are shorter, and the stichidia are gradually, not suddenly, acuminate.

Tab. 21. DASYA SCOPARIA. Fig. 1. A tuft:—*of the natural size.* 2. Apex of a branch, clothed with ramelli. 3. Ramelli with stichidia. 4. Apex of a ramellus, with a stichidium. 5. A tetraspore. 6. A cross section of the stem:—*all more or less highly magnified.*

7. **Dasya** (**Rhodonema**) velutina, *Sond.*; caule tereti setaceo inarticulato cartilagineo alterne ramoso, ramis patentibus simplicibus iterumve ramosis sub-articulatis ramellis roseis monosiphoniis brevissimis densissime velatis, ramellis patentissimis divaricato-dichotomis pluries furcatis rigidulis, articulis diametro 2–3-plo longioribus, terminali acuto. *Sond. in Bot. Zeit.* 1845, p. 53. (Tab. XXIII.)

Hab. Swan River Colony, *Preiss*, Port Phillip, *Mrs. Mallard.* (*v. s. in Herb. T. C. D. comm. cl. Binder, cl. Ward.*)

Frond three to four inches long, or more (imperfect specimens only seen), as thick as a bristle, cartilaginous, scarcely attenuated, alternately branched, the branches simple, or furnished with a second or third series of lesser branches. The older parts of the frond naked, but all the younger branches densely covered with minute equal ramelli, resembling the pile of velvet. These are not half a line in length, very patent, many times dichotomous, with very patent forkings, their apices acute. I have not seen any fruit. The *colour* is a full red.

Tab. 23. Dasya velutina. Fig. 1. A small specimen:—*of the natural size.* 2. A branch clothed with ramelli. 3. A ramellus. 4. A cross section of the stem.

8. **Dasya** (**Rhodonema**) elongata, *Sond.*; caule crasso longissimo alterne ramosissimo cartilagineo nudo, ramis elongatis iterum ramosis inarticulatis ramulis setaceis divaricatis basi nudis supra ramellis roseis monosiphoniis brevissimis densissime velatis, ramellis patentissimis divaricato-dichotomis pluries furcatis rigidulis, articulis diametro sesquiduplo longioribus, terminali acuto, stichidiis ovatis acuminatis, tetrasporis pluriseriatis. *Sond. in Bot. Zeit.* 1845, p. 53. (Tab. XXIII.)

Hab. Swan River Colony, *Preiss.* Port Phillip, *Mrs. Mallard.* (*v. s. in Herb. T. C. D. comm. cl. Ward.*)

Frond six to twelve inches long, as thick as whip-cord, cartilaginous, firm, very much, but irregularly, branched; *branches* alternate, patent, elongate, once or twice alternately divided, the lesser branches simple and virgate, laxly set with very patent setaceous ramuli from a quarter to half an inch in length. All parts of the frond, except the ramuli, are naked; these are naked at base, but densely clothed in their upper half with minute dichotomo-multifid, divaricating, single-tubed, rigid ramelli. *Stichidia* very short and broad, acuminate.

Nearly related to the following, from which it differs essentially in the nature of the ramelli, and in some minor characters.

Tab. 23. Dasya elongata. Fig. 1. A branch:—*of the natural size.* 2. Apex of a branch and ramulus, clothed with ramelli. 3. A ramellus with stichidium. 4. A tetraspore. 5. A cross section of the stem:—*all more or less magnified.*

9. **Dasya** (**Rhodonema**) naccarioides, *Harv.*; caule crasso longissimo alterne ramosissimo cartilagineo nudo, ramis elongatis pinnatim ramosis inarticulatis, ramulis setaceis erecto-patentibus basi nudis supra ramellis roseis monosiphoniis minimis densissime vestitis, ramellis patentibus basi crassiusculis, supra maxime attenuatis pluries furcatis flaccidis, articulis inferioribus diametro sub-duplo, superioribus quadruplo longioribus, stichidiis ovatis acuminatis, tetrasporis pluri-seriatis. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 432. (Tab. XXII.)

Hab. George Town Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond twelve inches, or more in length, one to two lines thick, cartilaginous, shrinking in drying, quite bare of ramelli, undivided, set throughout with numerous undivided, elongate lateral branches, which are furnished with a second and third series in a pinnate or bi-pinnate manner. The ultimate branchlets are setaceous, from a quarter to half an inch long, erecto-patent, naked at base, but have their upper half densely clothed with very slender and flaccid, single-tubed, jointed ramelli. These ramelli are not a quarter of a line long, patent, quadrifarious, many times dichotomous, with patent axils; their lower part thick, with short joints, their upper very slender and attenuated, with much larger joints. *Stichidia* borne on the ramelli, pedicellate, ovate, acute or mucronate. *Colour* of the frond, pale red; of the ramelli rosy.

This can only be confounded with the preceding, but the very different nature of the ramelli affords an obvious distinction. It has something the habit of *Naccaria Wigghii*, especially in the club-shaped branchlets, but it is much more robust than that plant.

Tab. 22. Dasya naccarioides. Fig. 1. Portion of a frond:—*of the natural size.* 2. Part of a branch, with branchlets and ramelli. 3. A ramellus, with stichidia. 4. A stichidium:—*all more or less magnified.*

Subgenus 3. LOPHOTHALIA, *Harv.*

10. Dasya (Lophothalia) verticillata, *Harv.*; caule crasso longissimo glabro inarticulato alterne ramoso, ramis elongatis gracilibus basi angustatis iterum et iterum alterne compositis, minoribus subarticulatis ramellis monosiphoniis simplicibus strictis verticillatis, verticillis crebris, articulis ramellorum diametro 4–8-plo longioribus, stichidiis racemosis ramellis densissime vestitis. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 434. (Tab. XXIV.)

Hab. George Town, Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond (imperfect specimens only seen) eight to ten inches long, or more, a line in diameter below, gradually attenuated, undivided, furnished with alternate branches, the lowest of which are longest. *Branches* tapering to the base and apex, much more slender than the stem, twice pinnated with branchlets, the smaller of which show external signs of joints. The two last series of branches are whorled at short intervals with simple, byssoid, single-tubed ramelli, whose joints are four to eight times longer than broad, the lower joints being the shortest. *Substance* cartilaginous, the stem imperfectly adhering to paper; the lesser branches very flaccid and tender. *Colour* a fine crimson-red. A transverse section of the stem shows four principal tubes surrounding a minute central cavity, and four minor intermediate ones; the spaces between being densely cellular.

This species was originally described from an imperfect specimen without fruit; I have since examined, in Sir W. J. Hooker's Herbarium, another, partially decayed, but producing abundance of stichidia. These organs are very curious, and unlike those of any other genus, except *D. bolbochæte.* They are formed, not by metamorphosis of the *ramelli,* but of the polysiphonous *ramuli,* and are, like normal branches, clothed with verticellate ramuli! They, moreover, form a compound stichidium or racemoid series of stichidia, the central one, or *rachis,* being very long, lanceolate

Hab. [illegible] Herb. T. C. D. [illegible] Hooker.)

[illegible] throughout with alternate [illegible] furnished with a [illegible] in a pinnately [illegible] [illegible] Colour [illegible]

This [illegible] but the very different [illegible] of [illegible]. It has something the habit of *Nemastoma* [illegible] but it is much more robust than that plant.

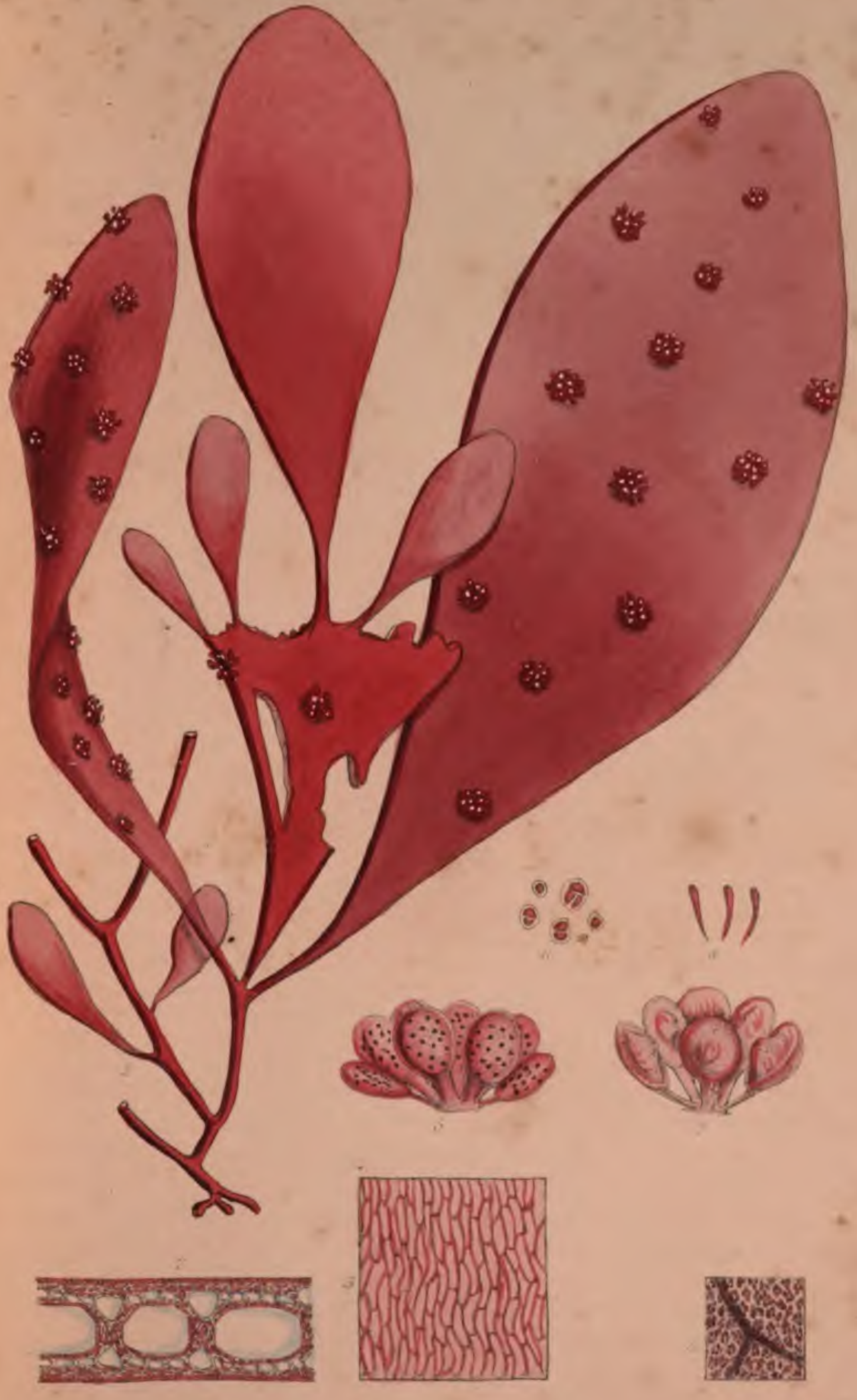
Fig. [illegible] Portion of a frond [illegible] of the natural size. 2. [illegible] 3. A ramellus, with stichidia. 4. A [illegible]

Subgenus 3. [illegible], *Harv.*

[illegible] glabra [illegible] diametro 4–8-plo longioribus [illegible] *Harv. in Hook. Lond. Journ. Bot.* vol. [illegible]

Hab. [illegible] Herb. T. C. D. [illegible] Hooker.)

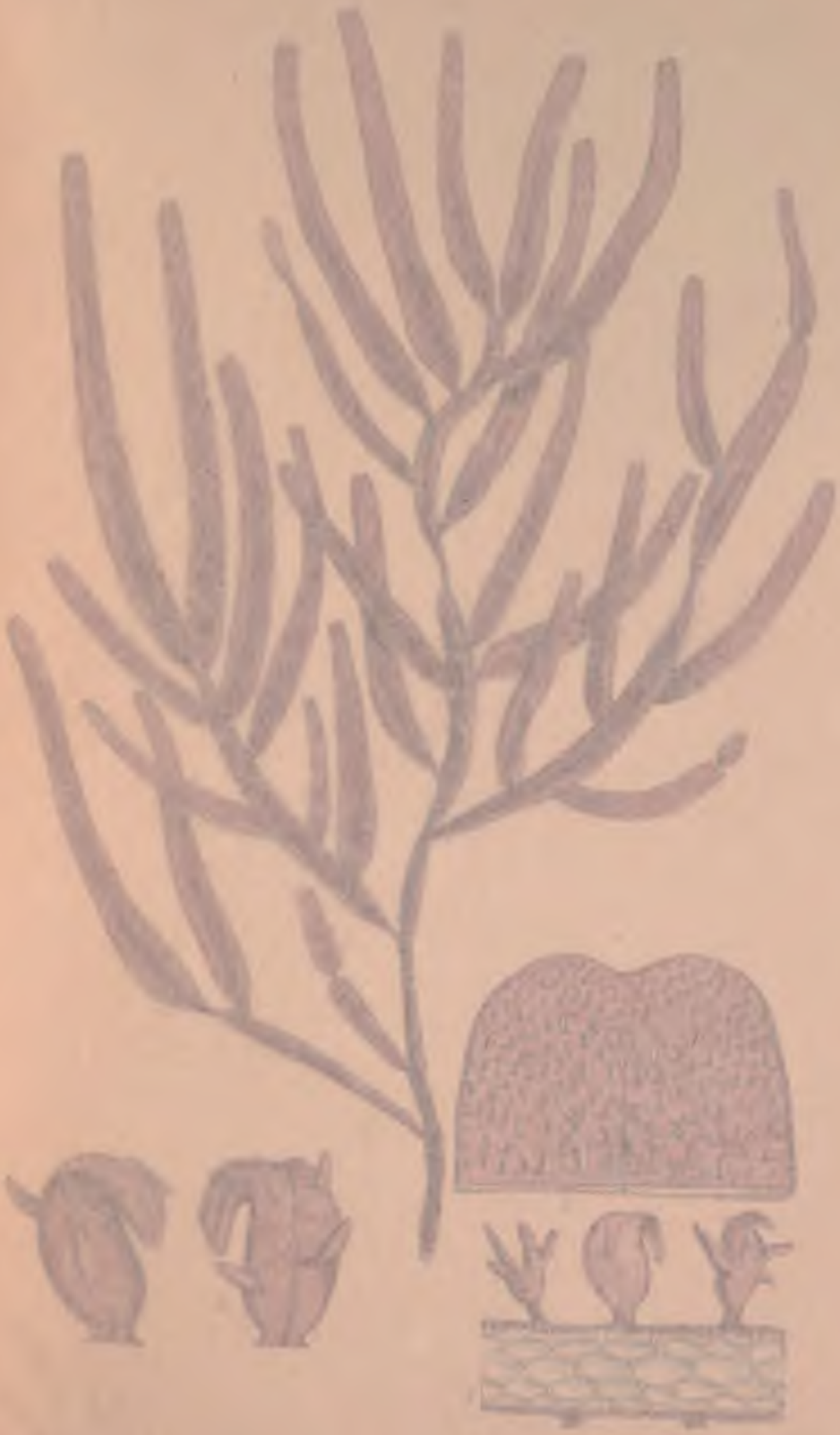
[illegible] ten inches long, or more, a line in diameter below, [illegible] furnished with alternate branches, the lowest of which are [illegible] base and apex, much more slender than [illegible] the smaller of which show [illegible]



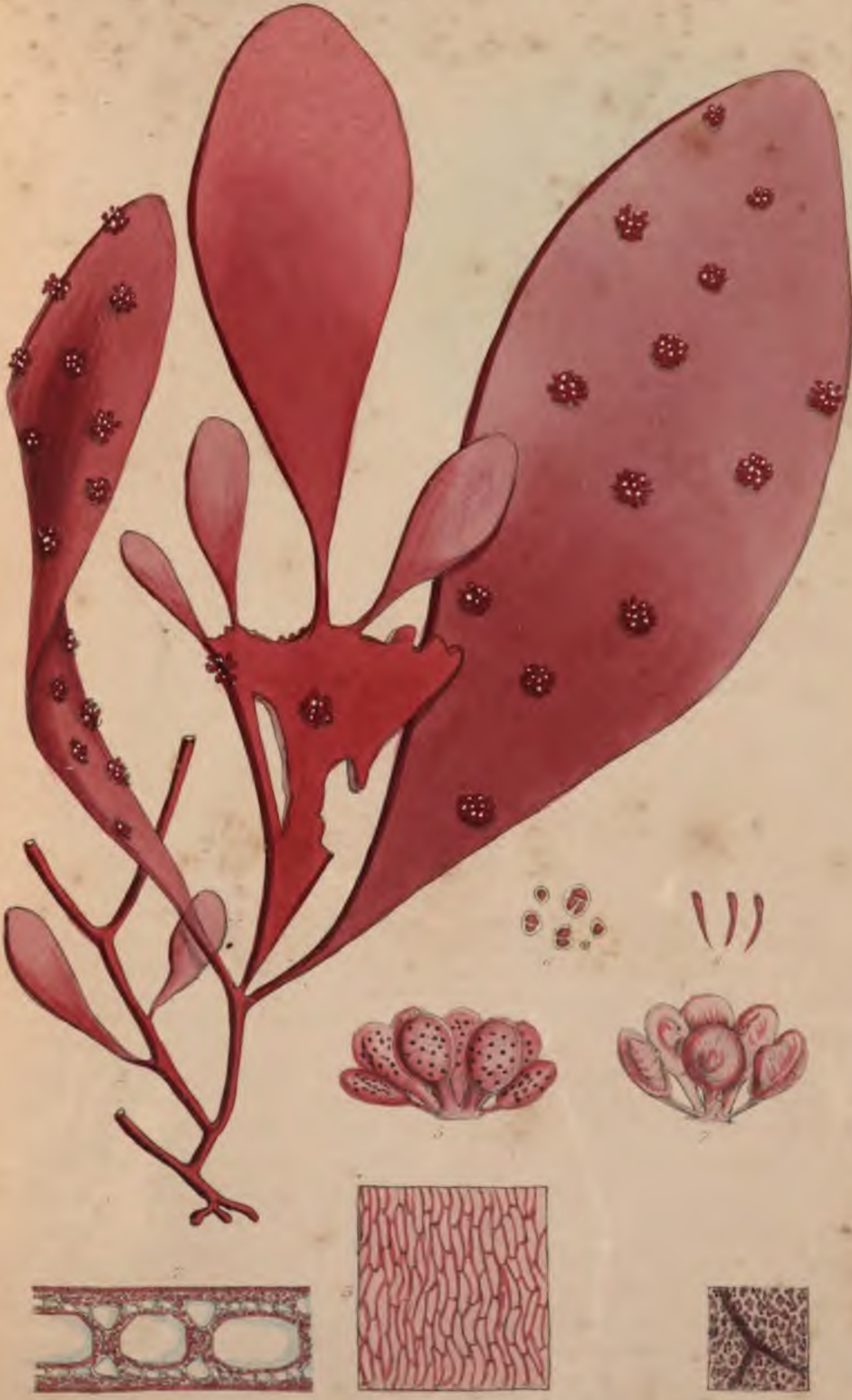
W.H.H. del. et lith.

Reeve imp.

Botryocarpa prolifera



Pl. [illegible]

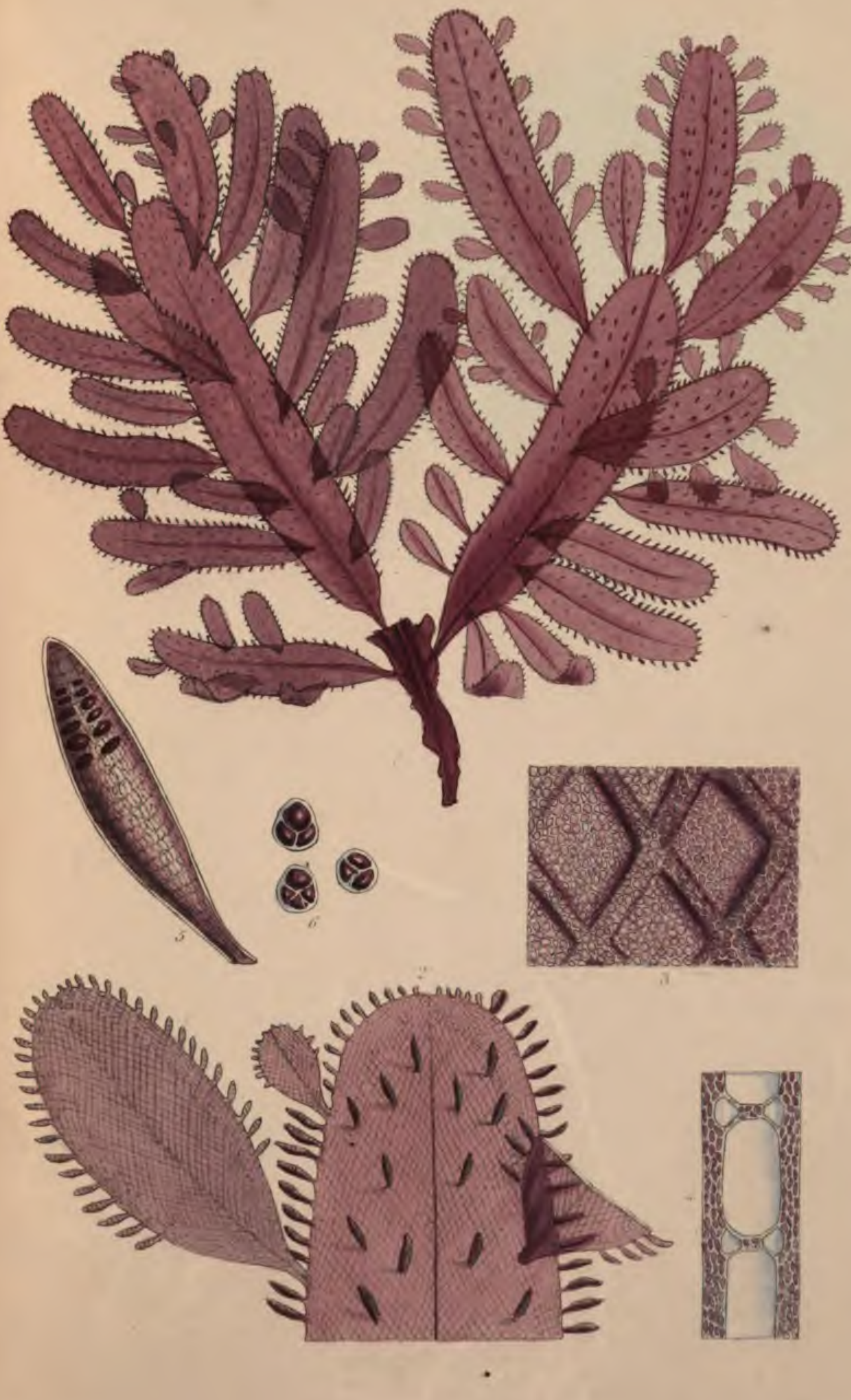


W. H. H. ad n. del.

Reeve imp.

Botryocarpa prolifera

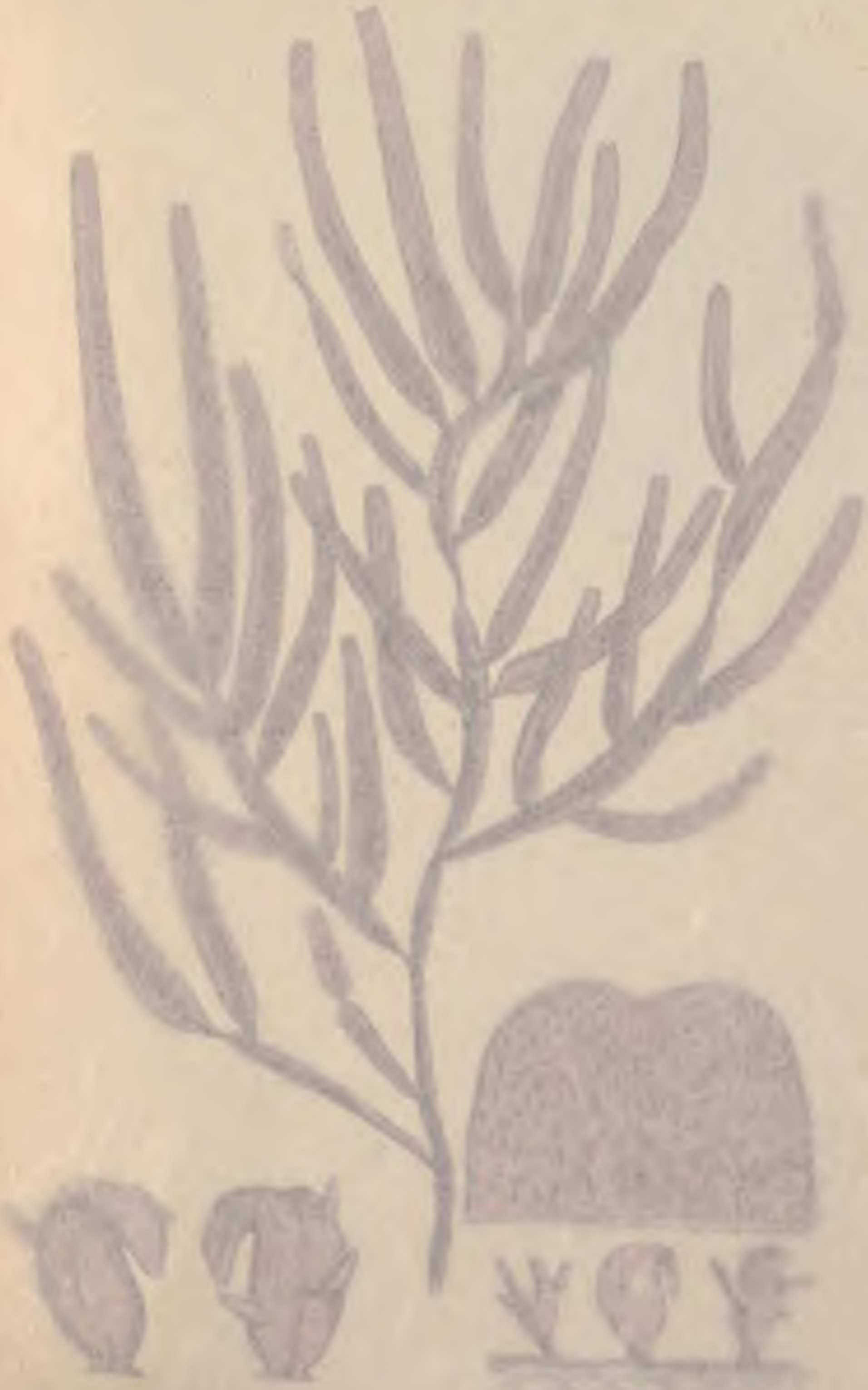
Tav. 2.



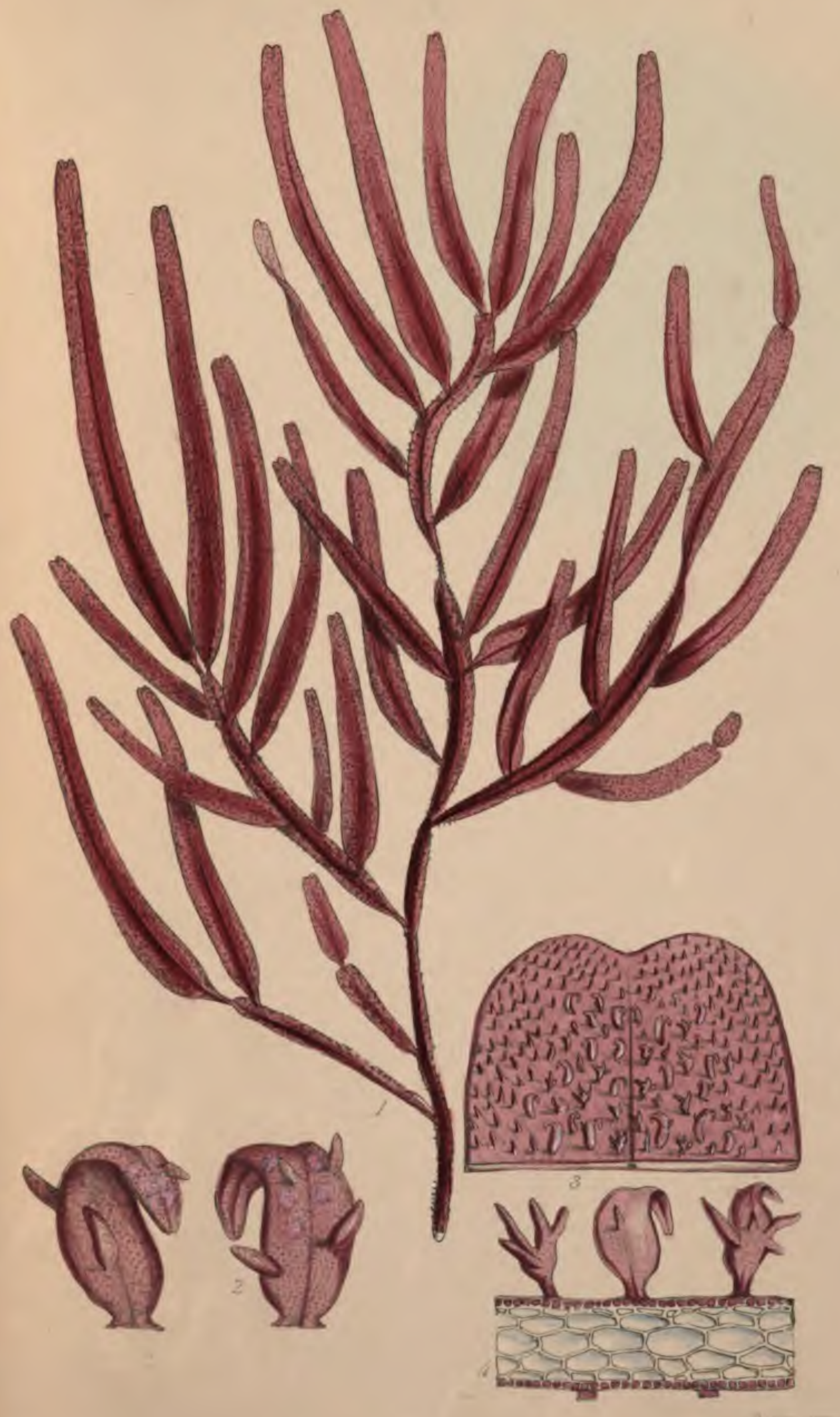
W.C.S. del. et lith.

Reeve imp.

Lenormandia marginata.



Tab. III.

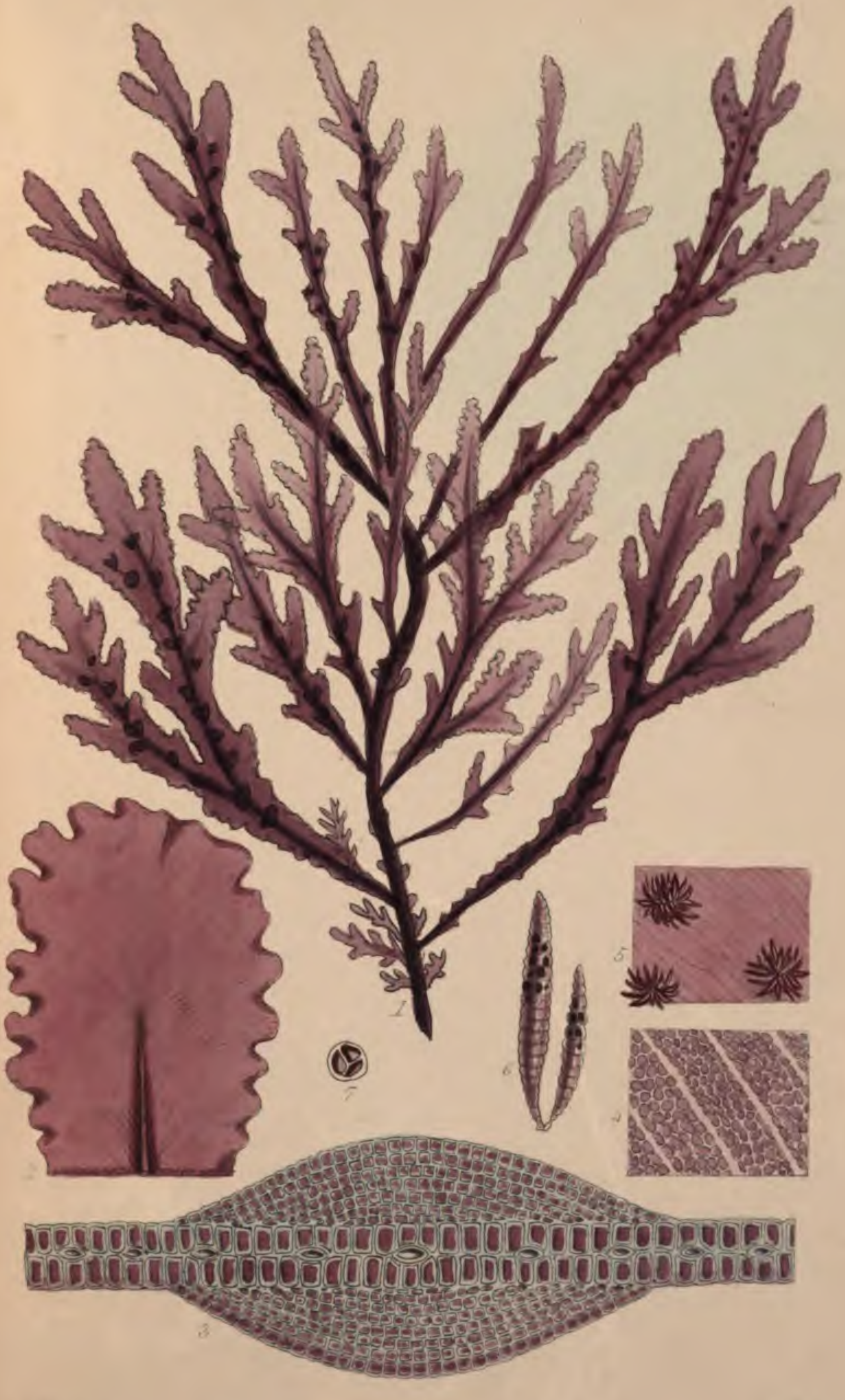


W. H. H. del. et lith.

Reeve imp.

Polyphacum Smithiæ

Tab IV

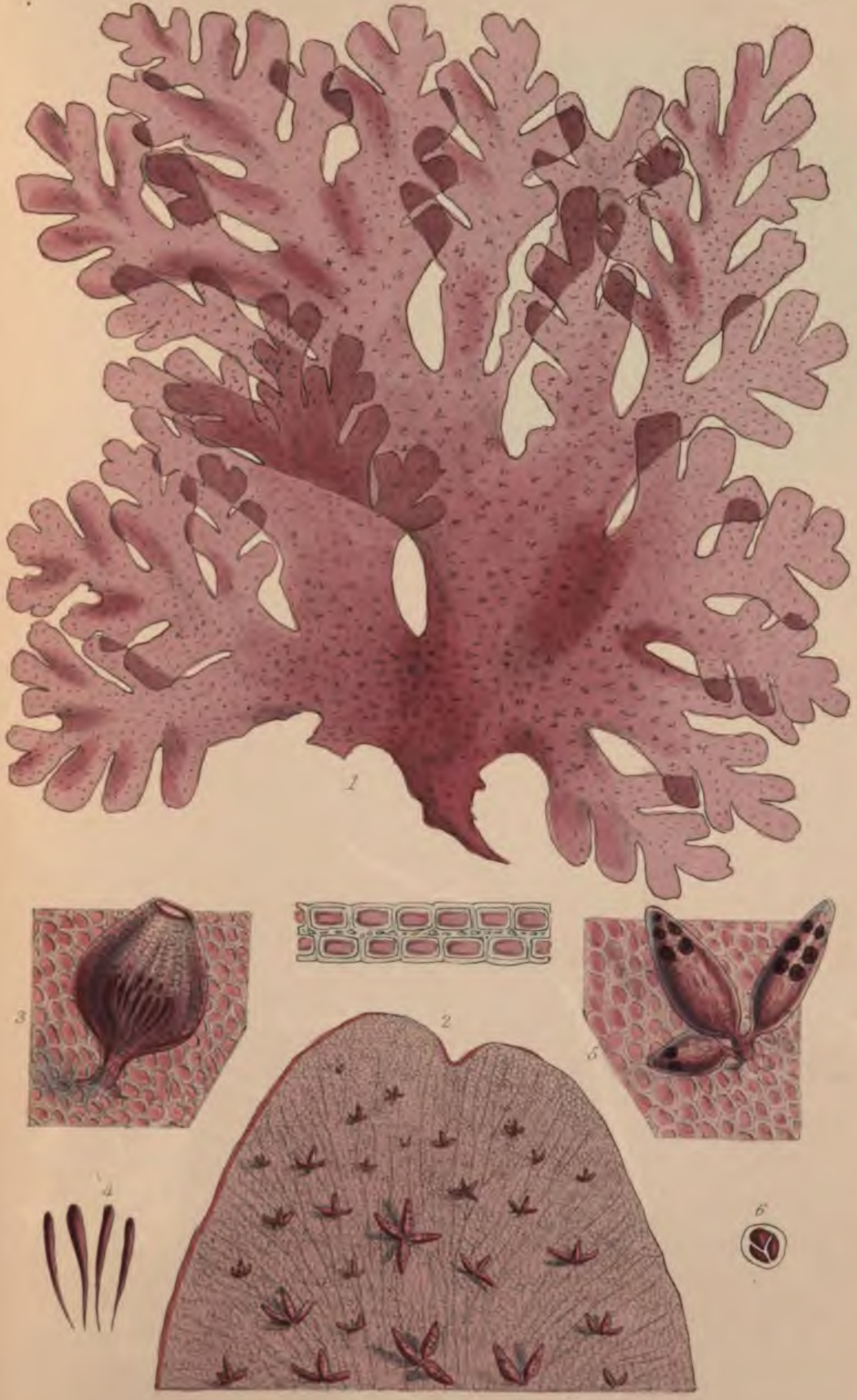


W.H.H. del et lith

Reeve imp

Jeanneretia lobata

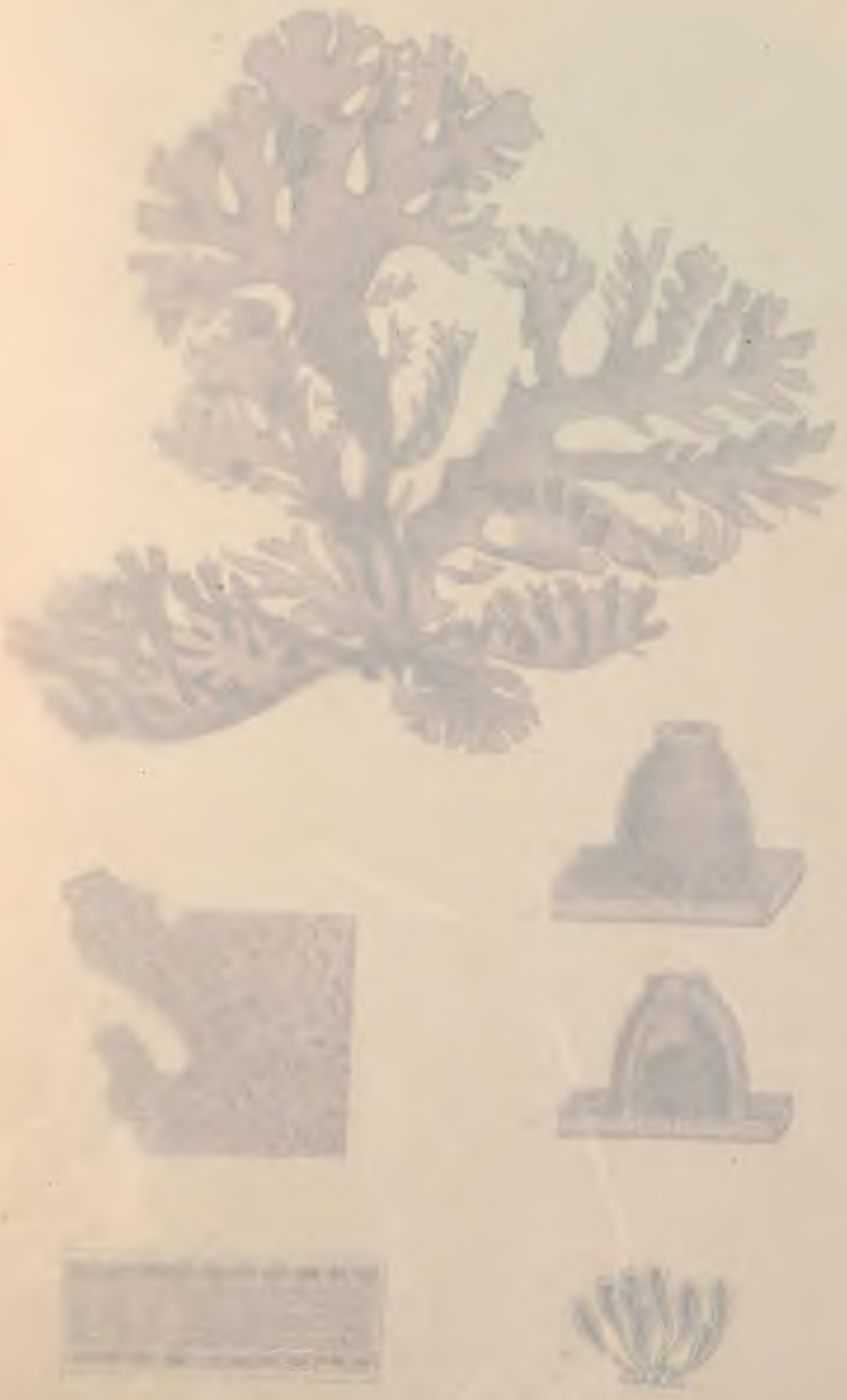
Tab. V.



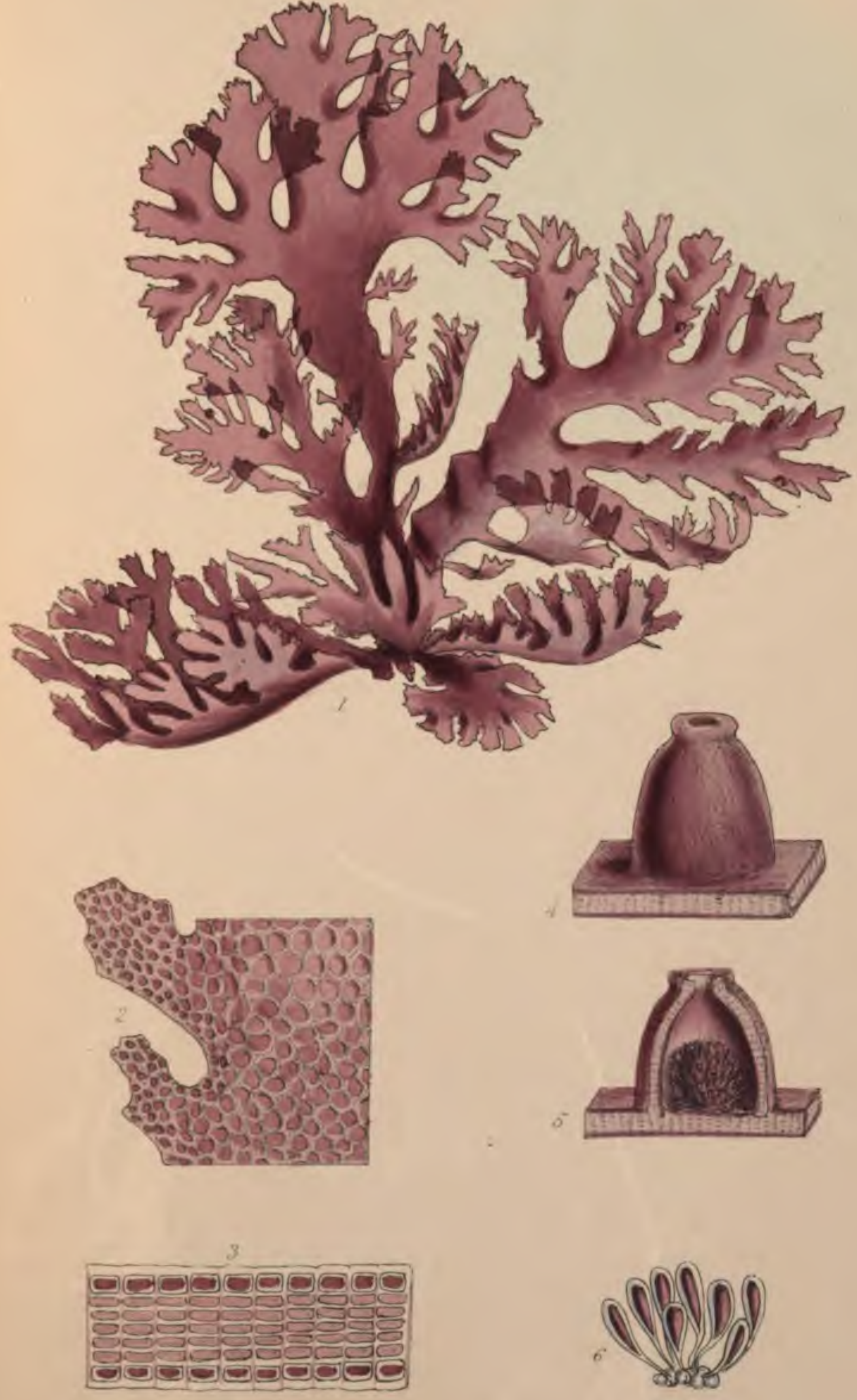
W.H.H. del. et lith.

Reeve imp.

Pollexfenia pedicellata



Tab. VI.

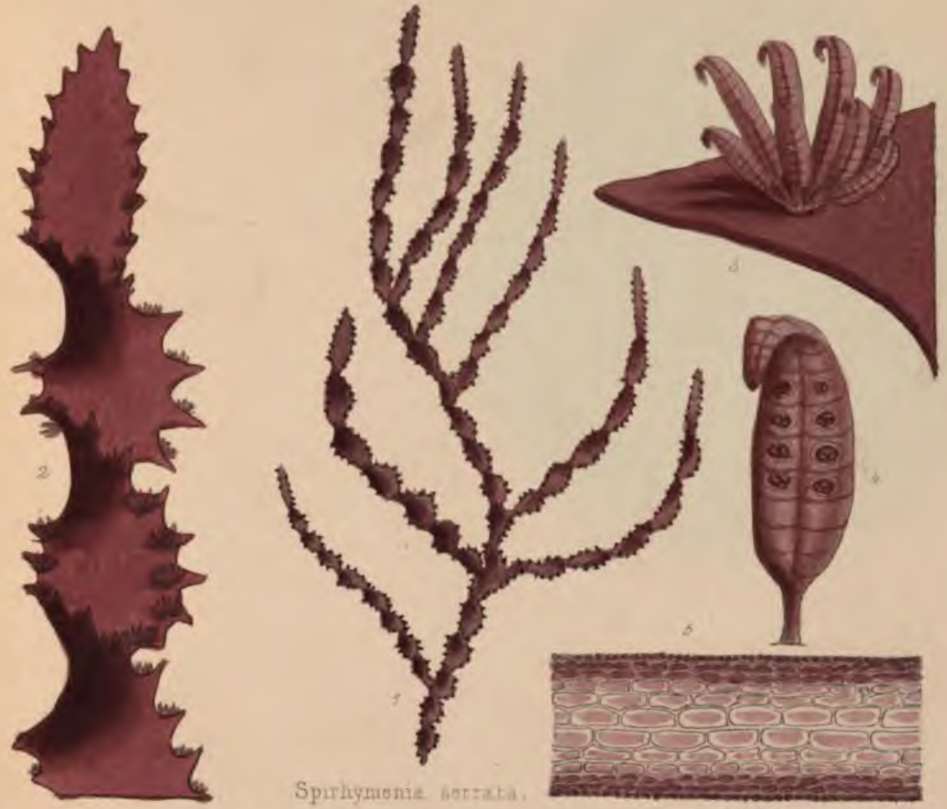


W H H del et lith

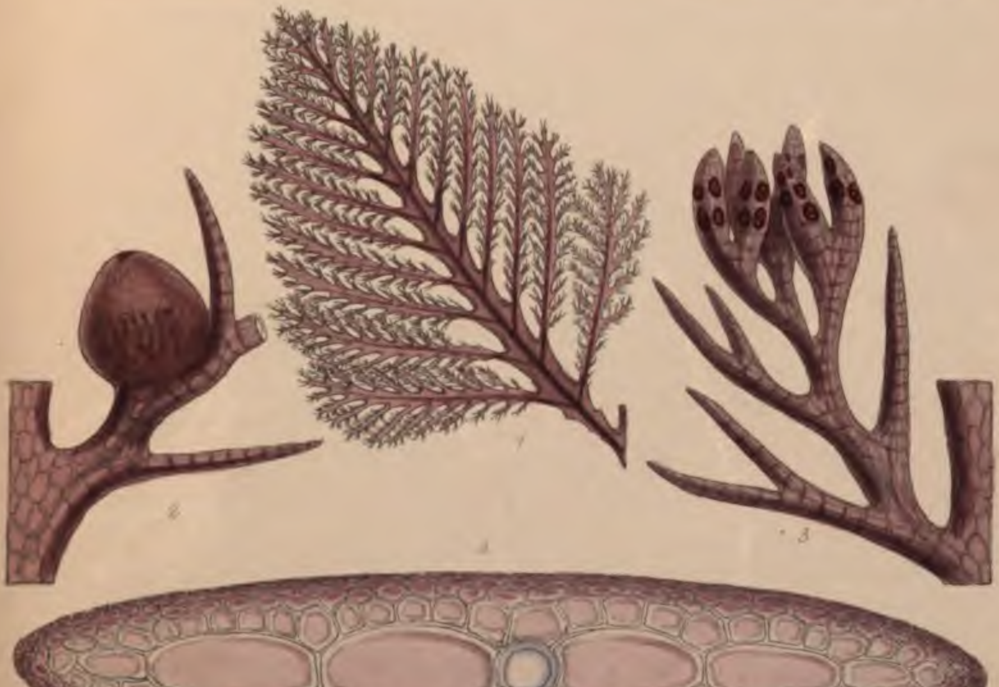
Reeve imp

Pollexfenia laciniata.

Tab. VII.



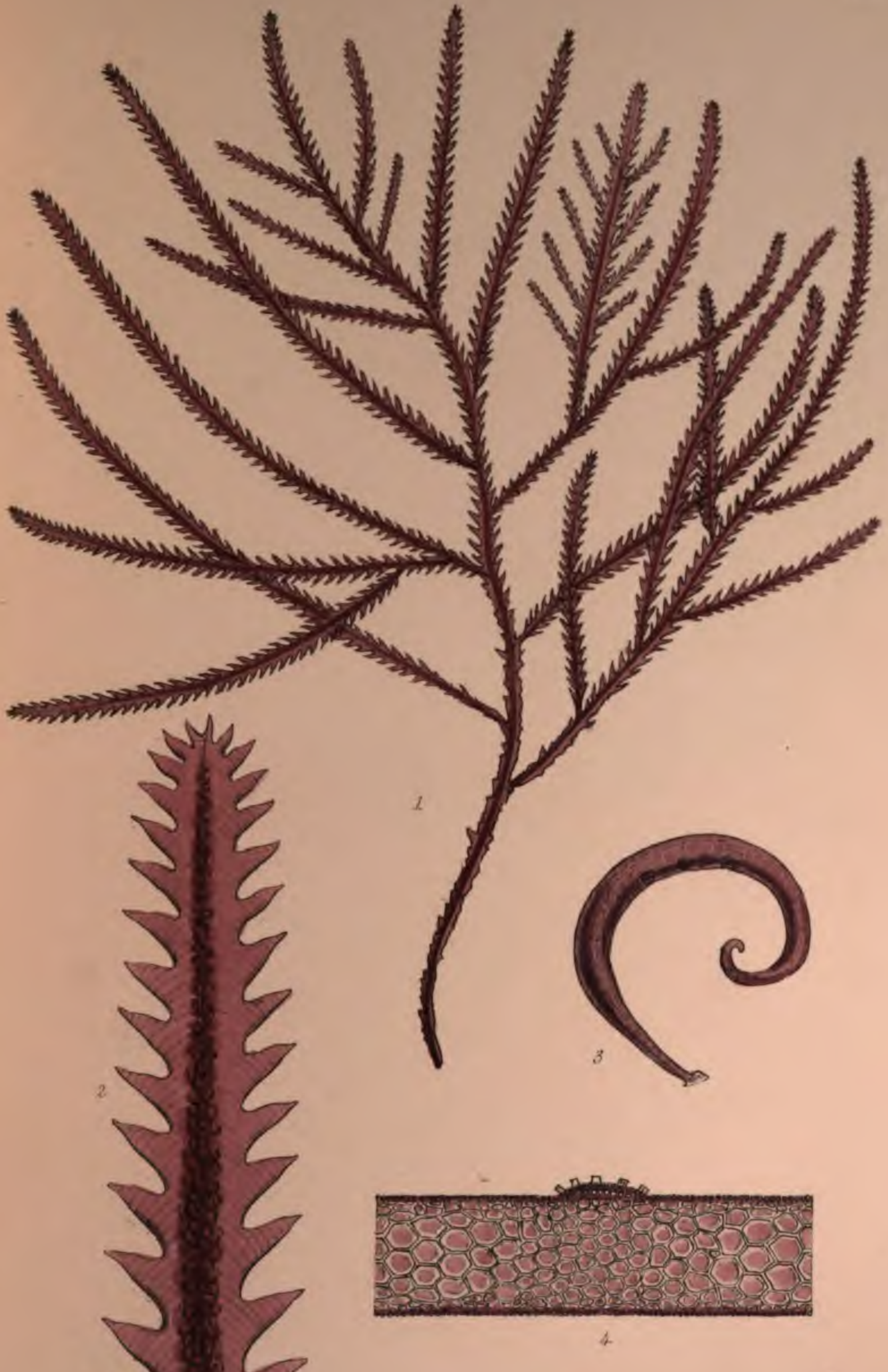
Spirhymenia serrata.



W.H.H. del. et lith.

Dictymenia tridens.

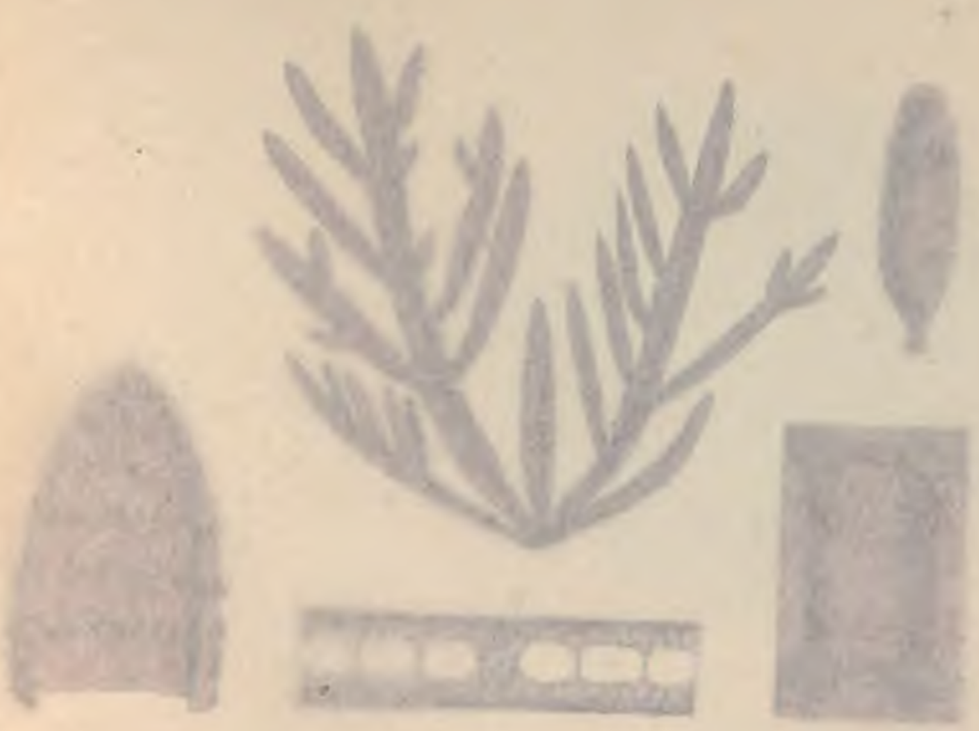
Reeve, imp.



W.H.H. del. et lith.

Epineuron Colensoi

Reeve, imp.



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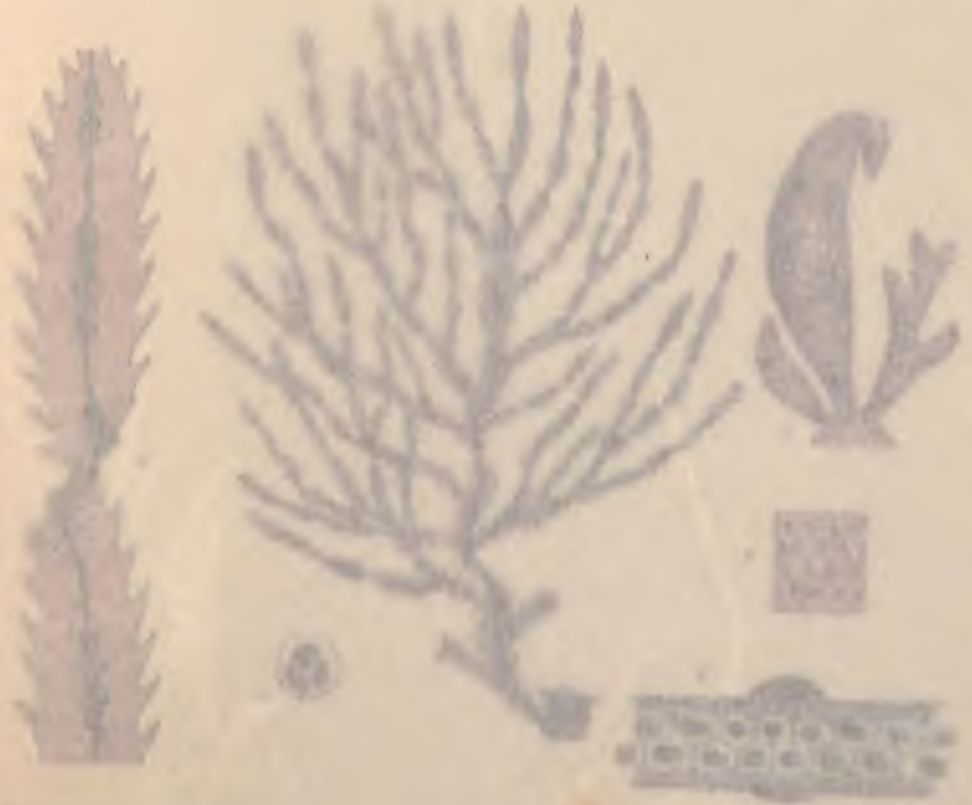

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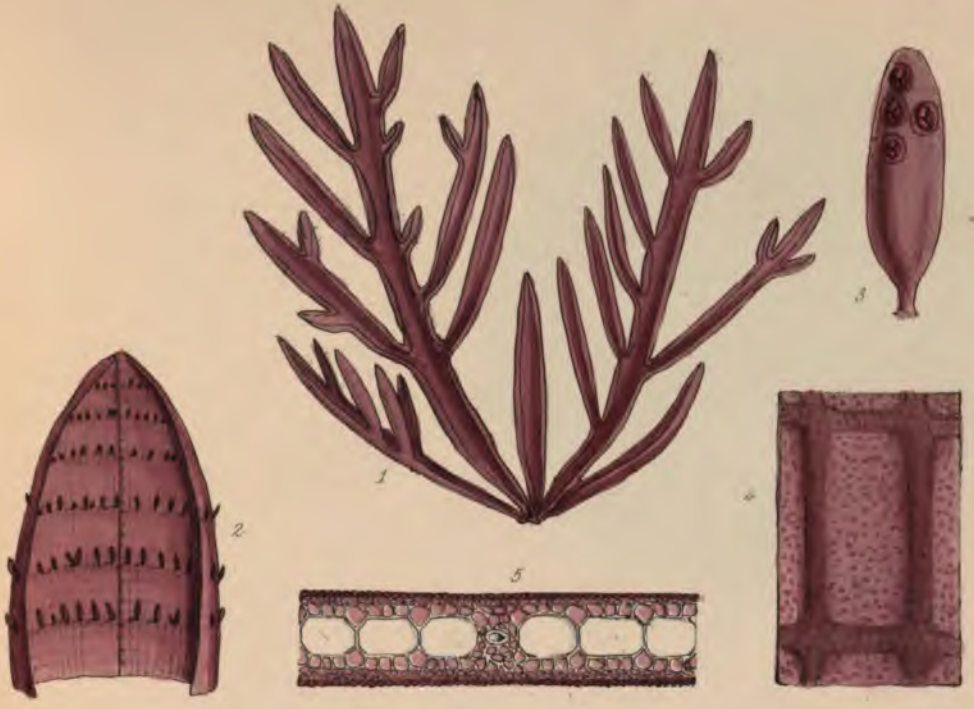
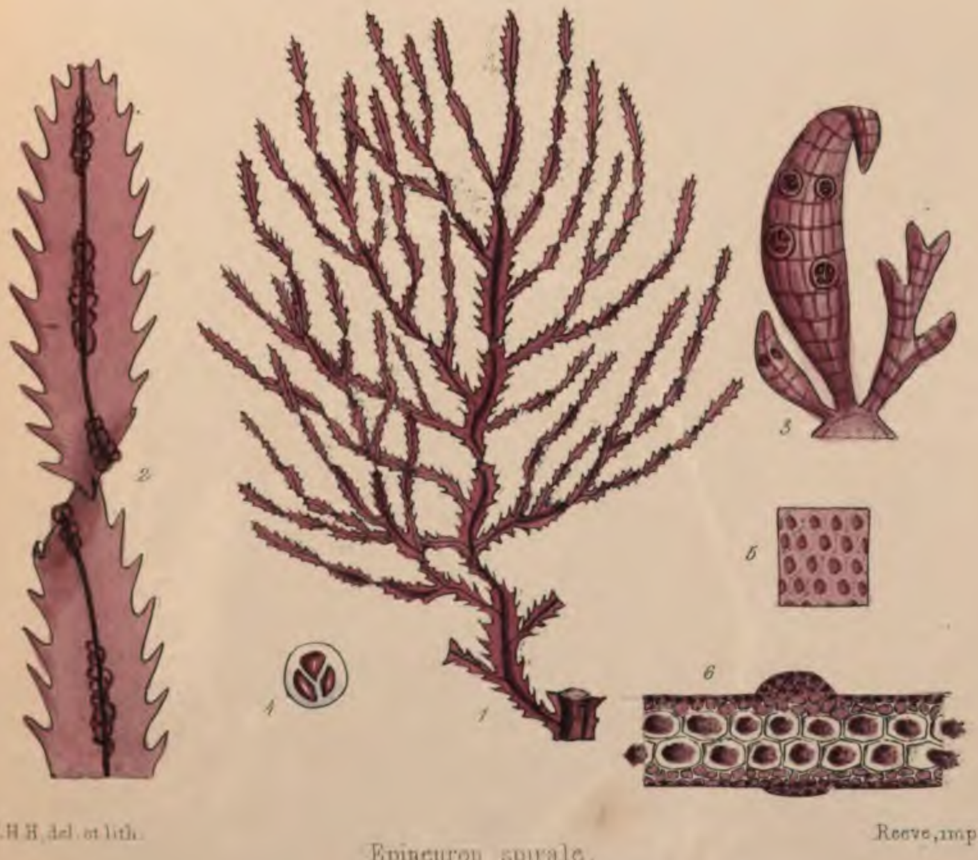
Tab. IX.



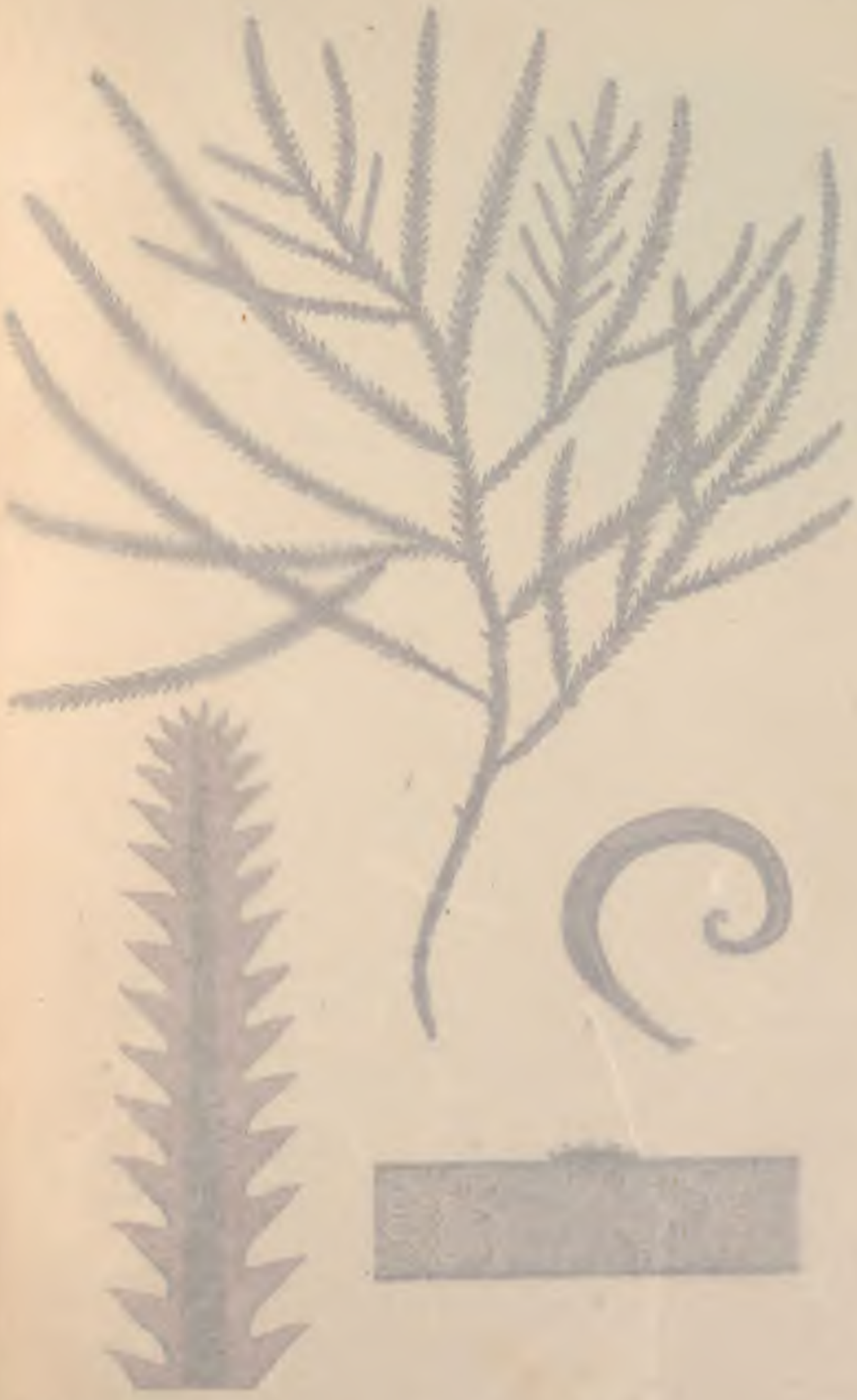
Kützingia canaliculata.

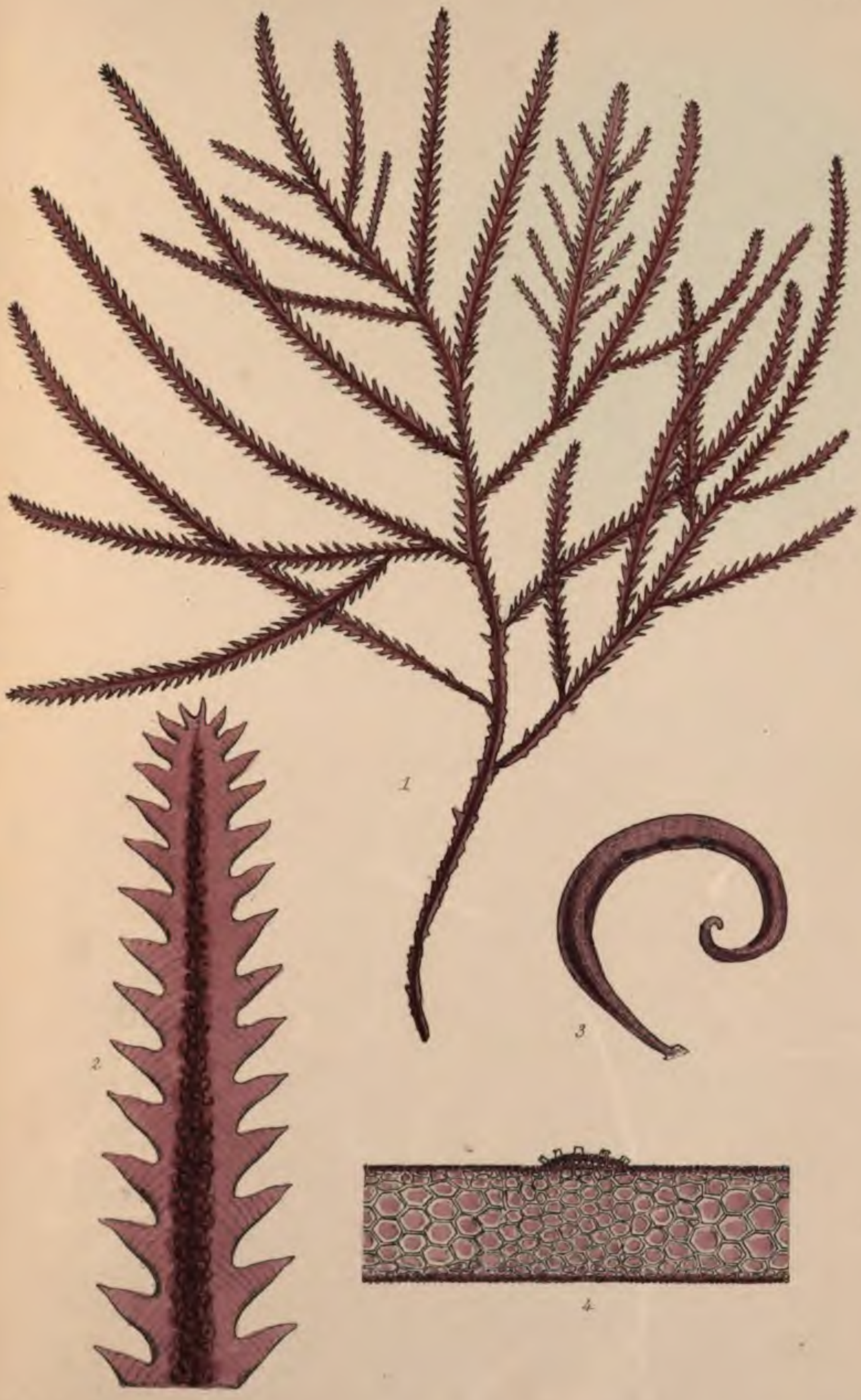


W.H.H. del. et lith.

Reeve, imp.

Epineuron spirale.



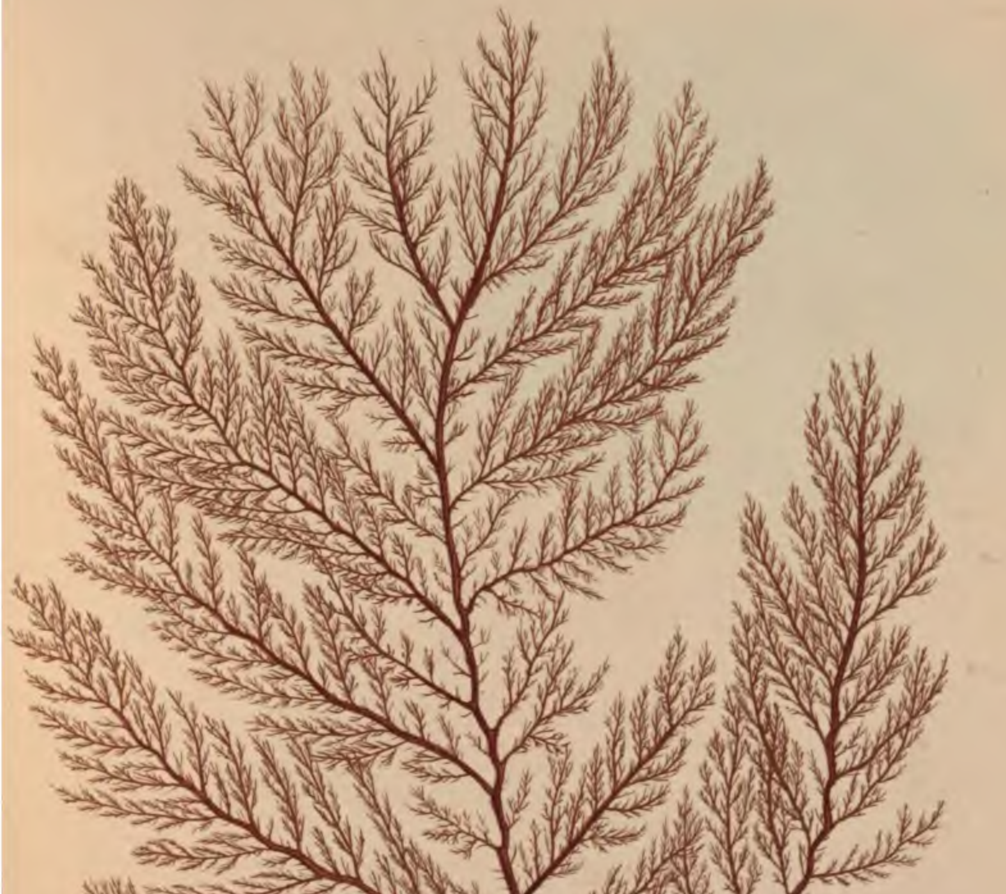


W. H. H. del. et lith.

Epineuron Colensoi

Reeve, imp.

Tab. XI.

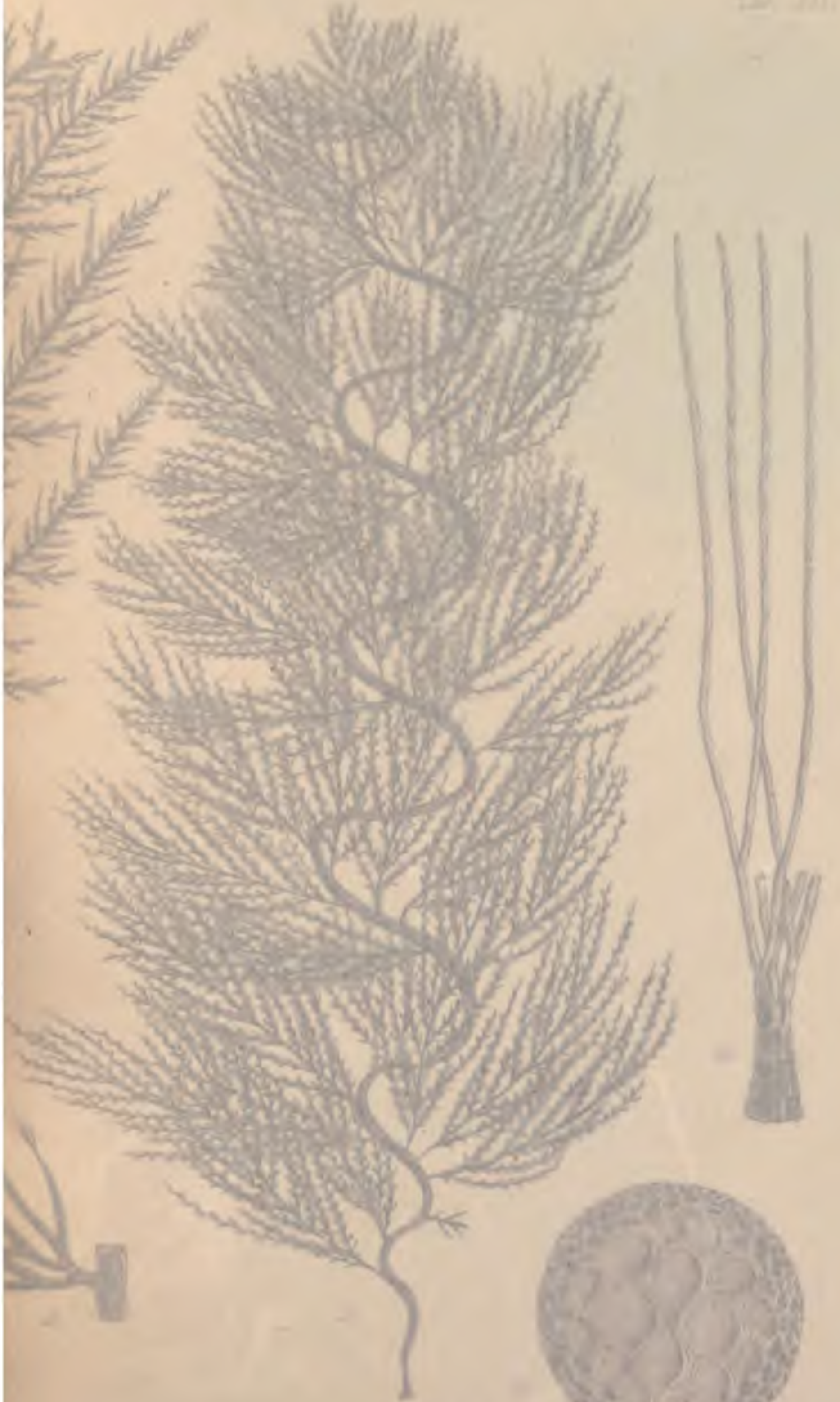


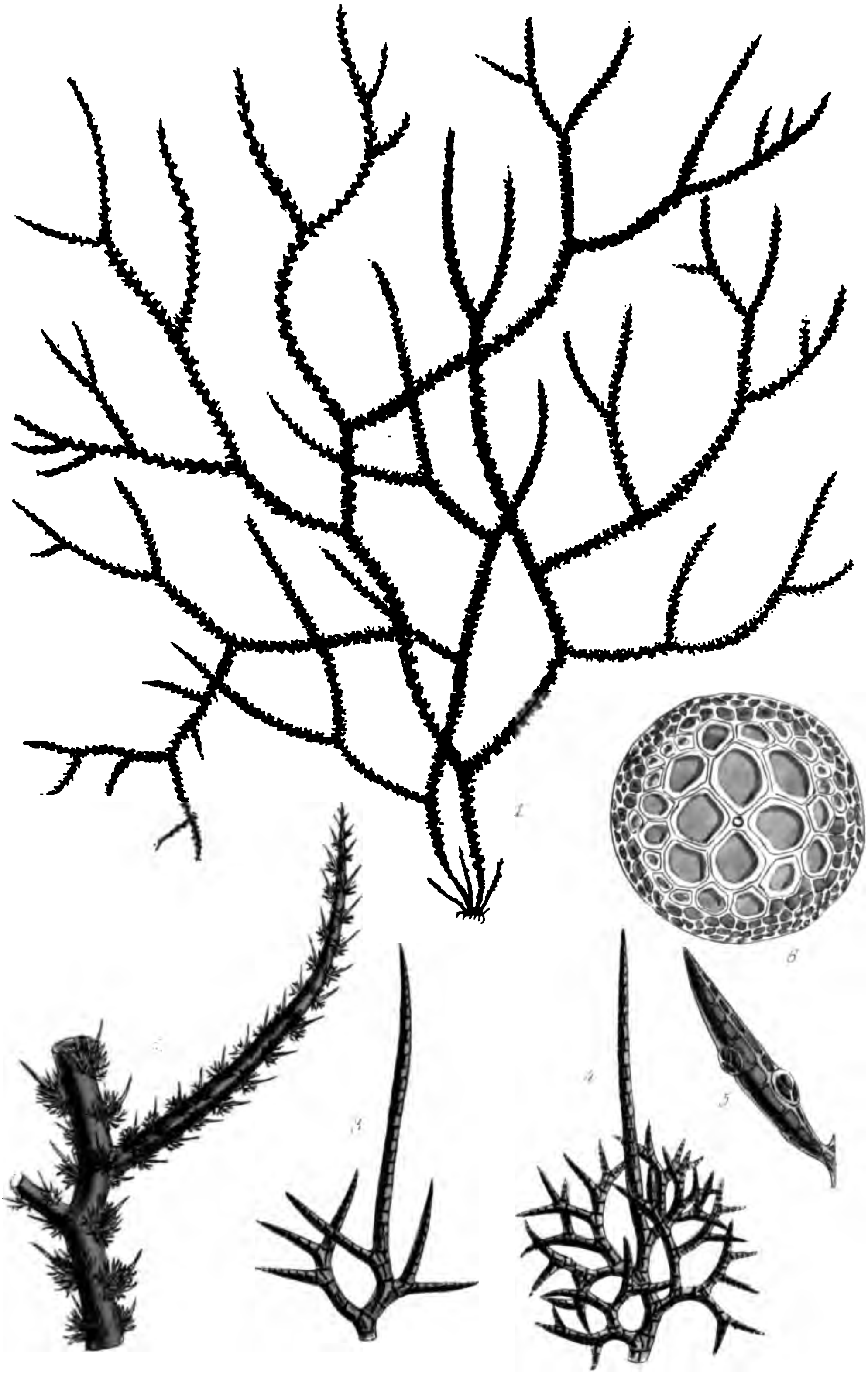
W.H.H. del et lith

Rhodomela comosa.

Reeve, imp

Tab. XIII.

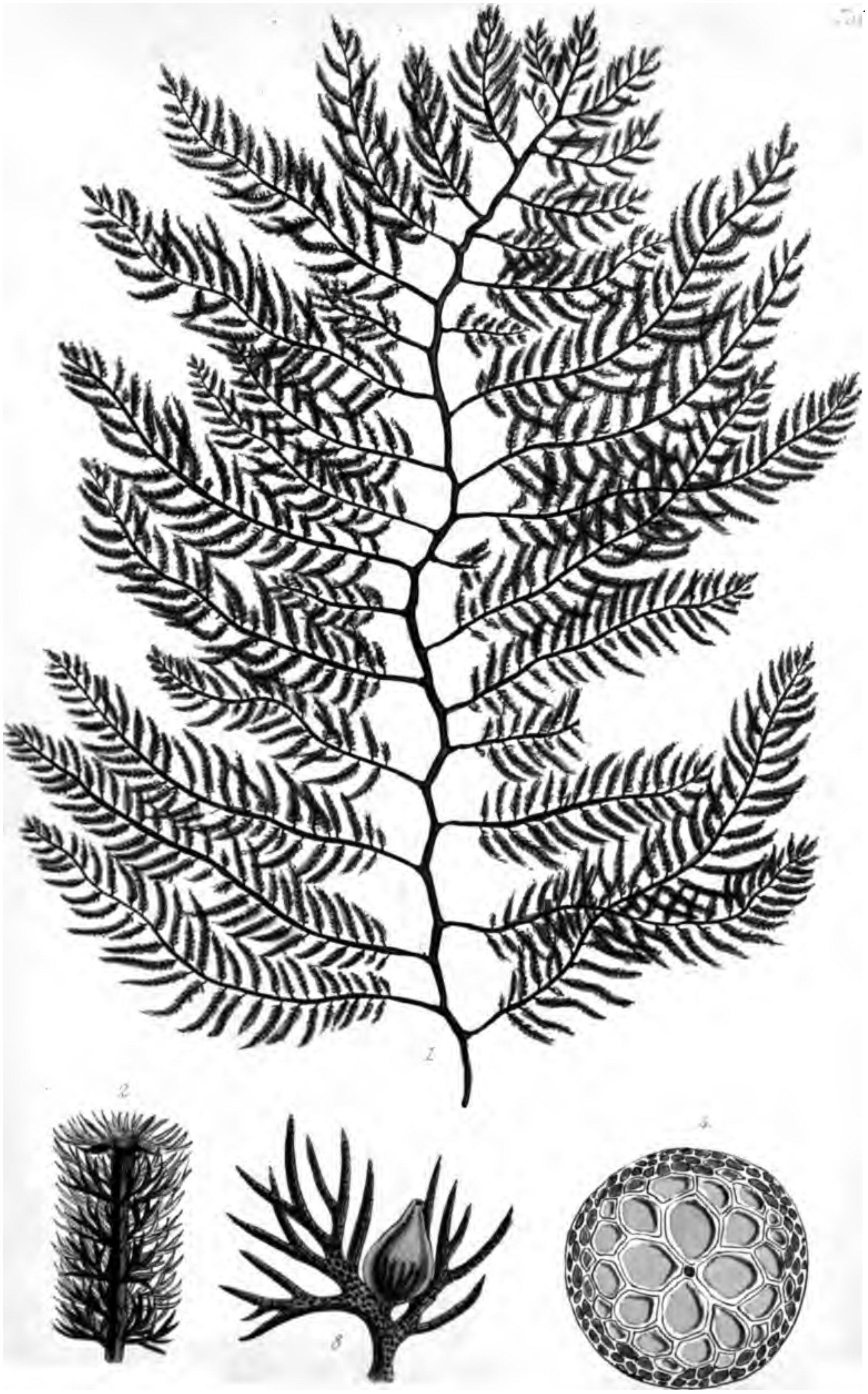




W.H.H. del. et lith.

Polysiphonia hystrix

Reeve imp.

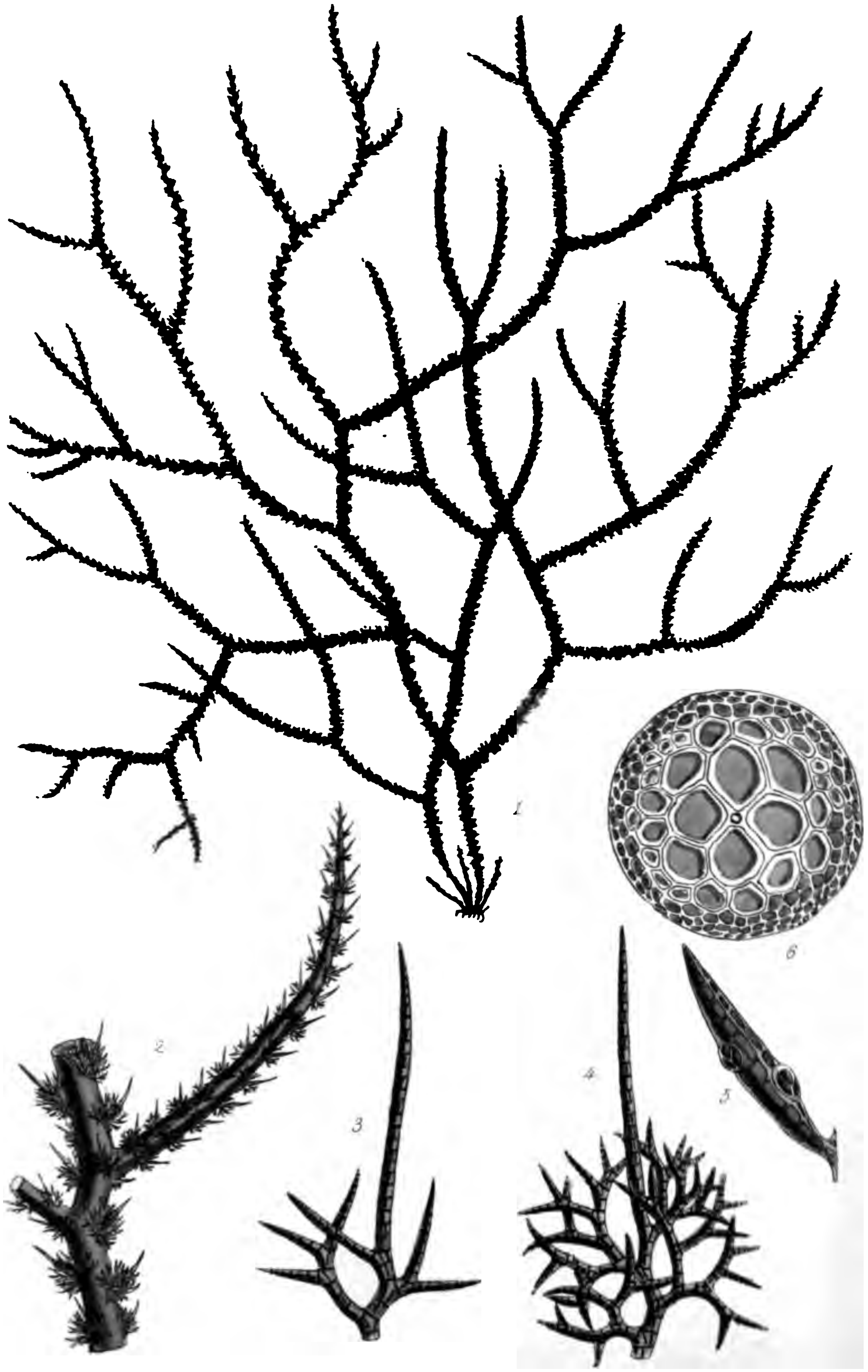


[illegible] del.

[illegible] Mülleriana.

[illegible] imp.

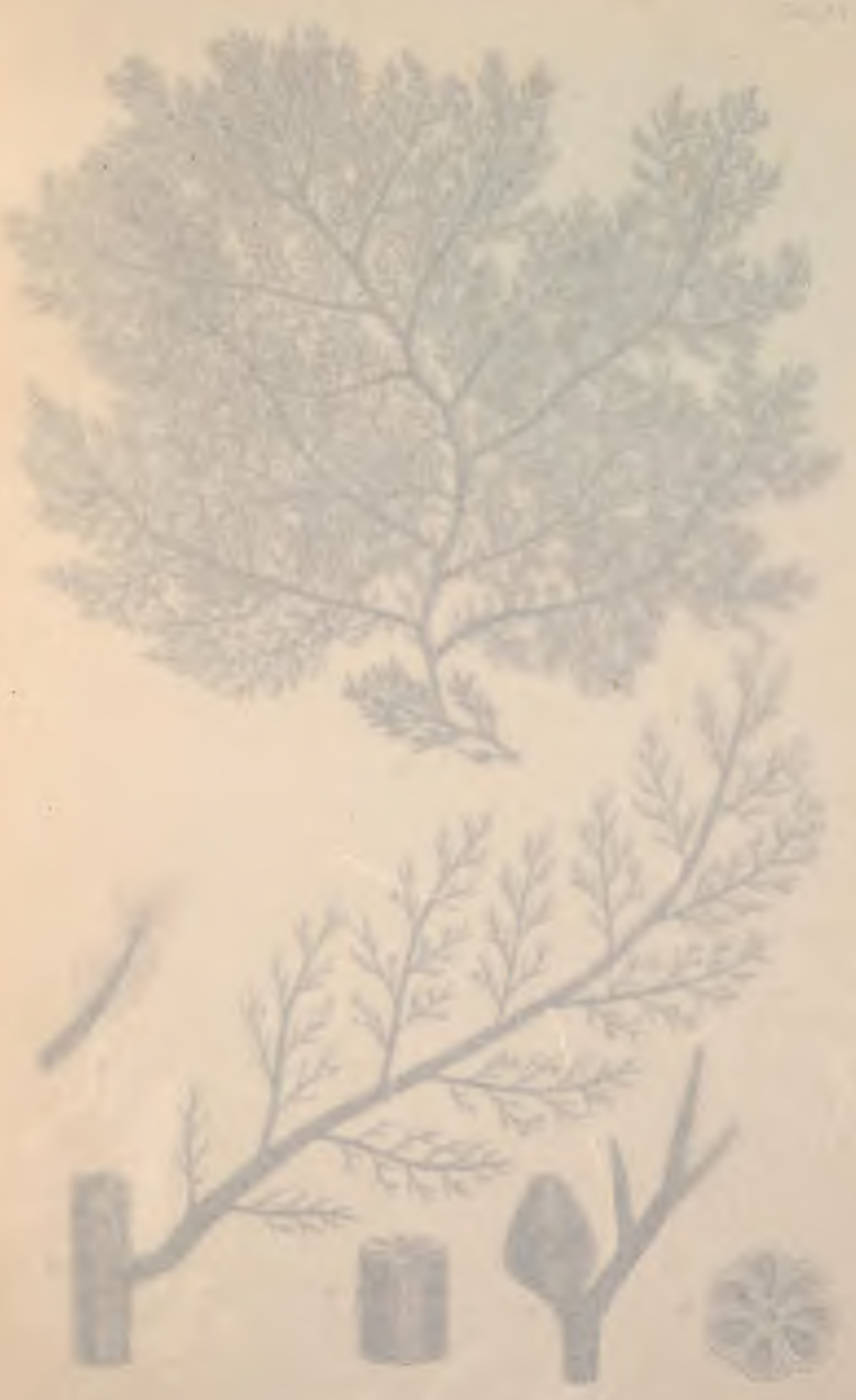
Tab. XIV.



W. H. H. del. et lith.

Polysiphonia hystrix.

Reeve, imp.



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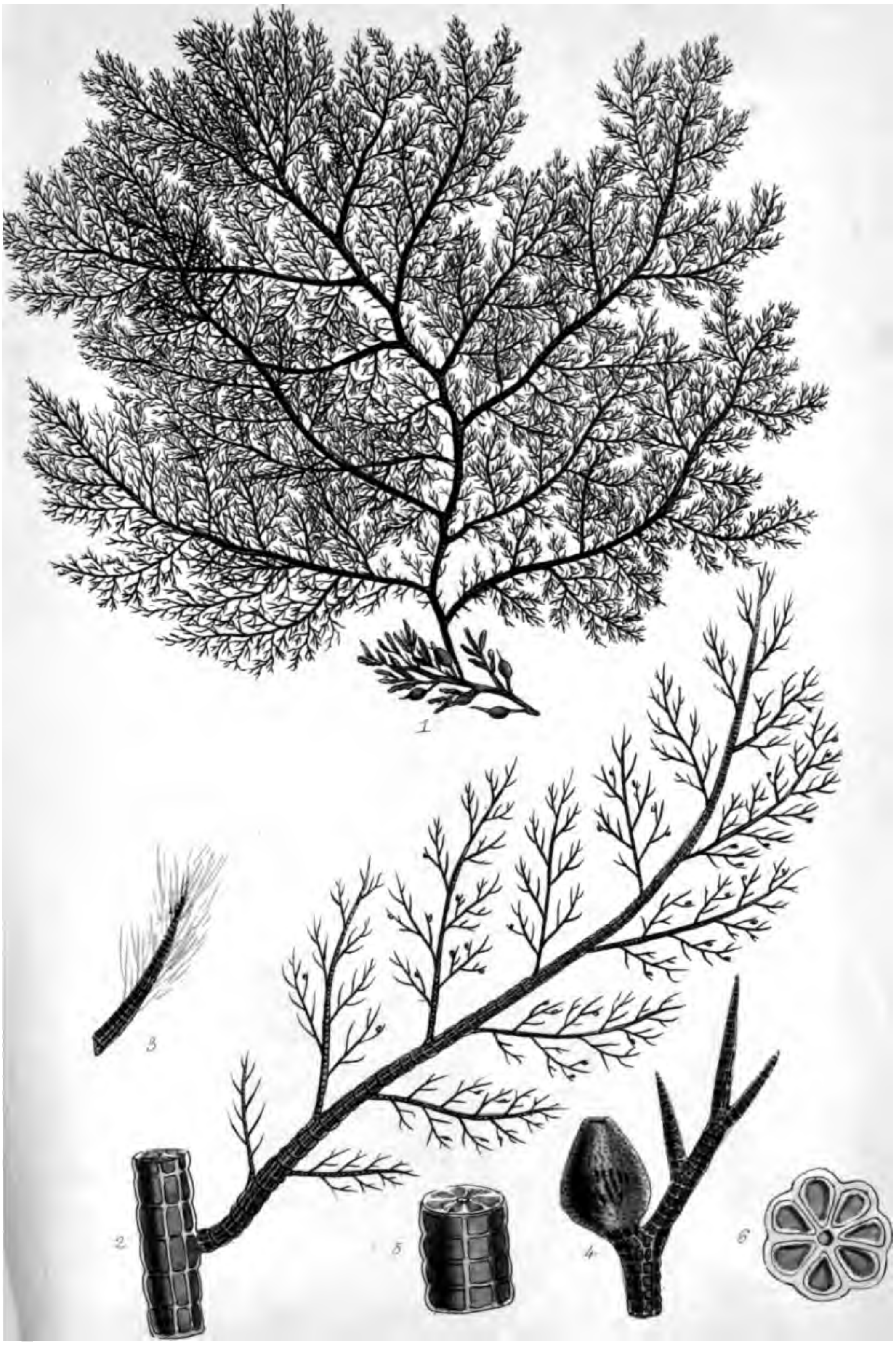
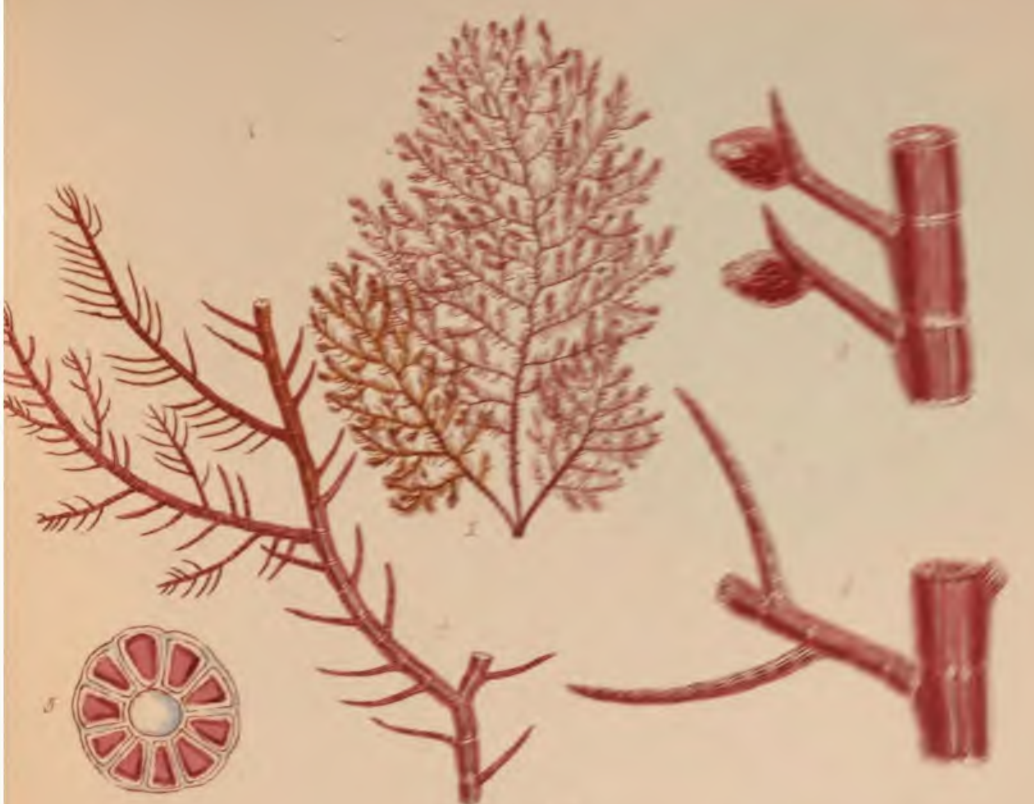


Reeve, imp.

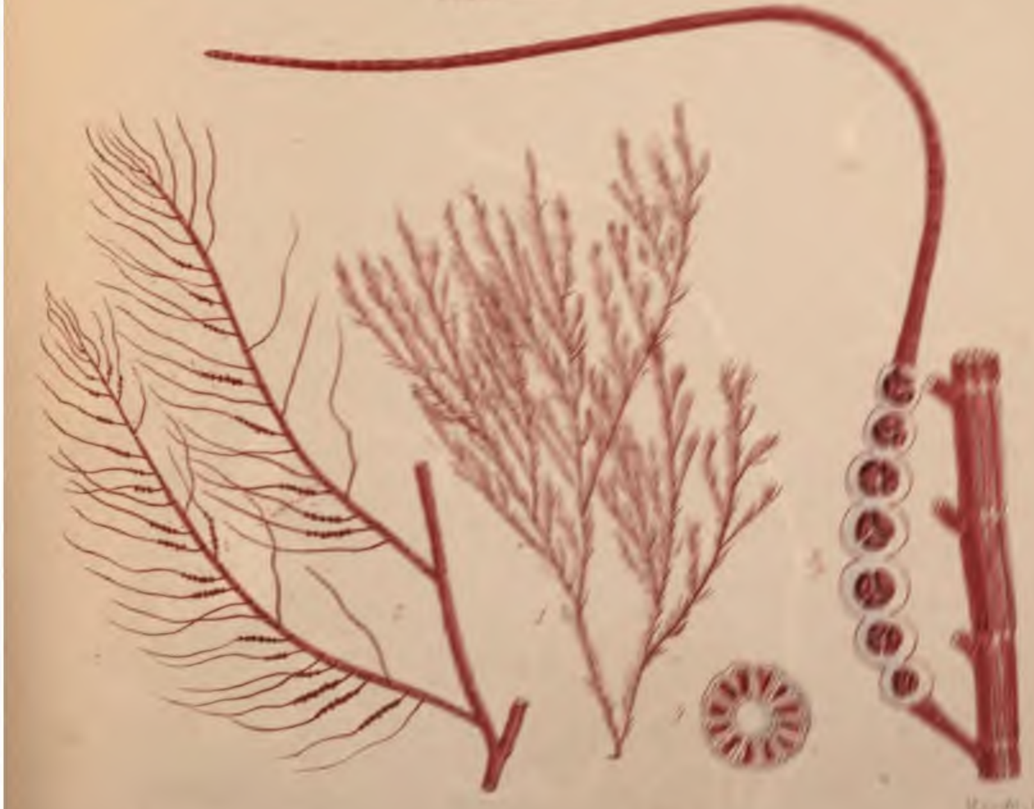
W. Fitch, del et lith.

Polysiphonia fastigiata

Tab. XVI.



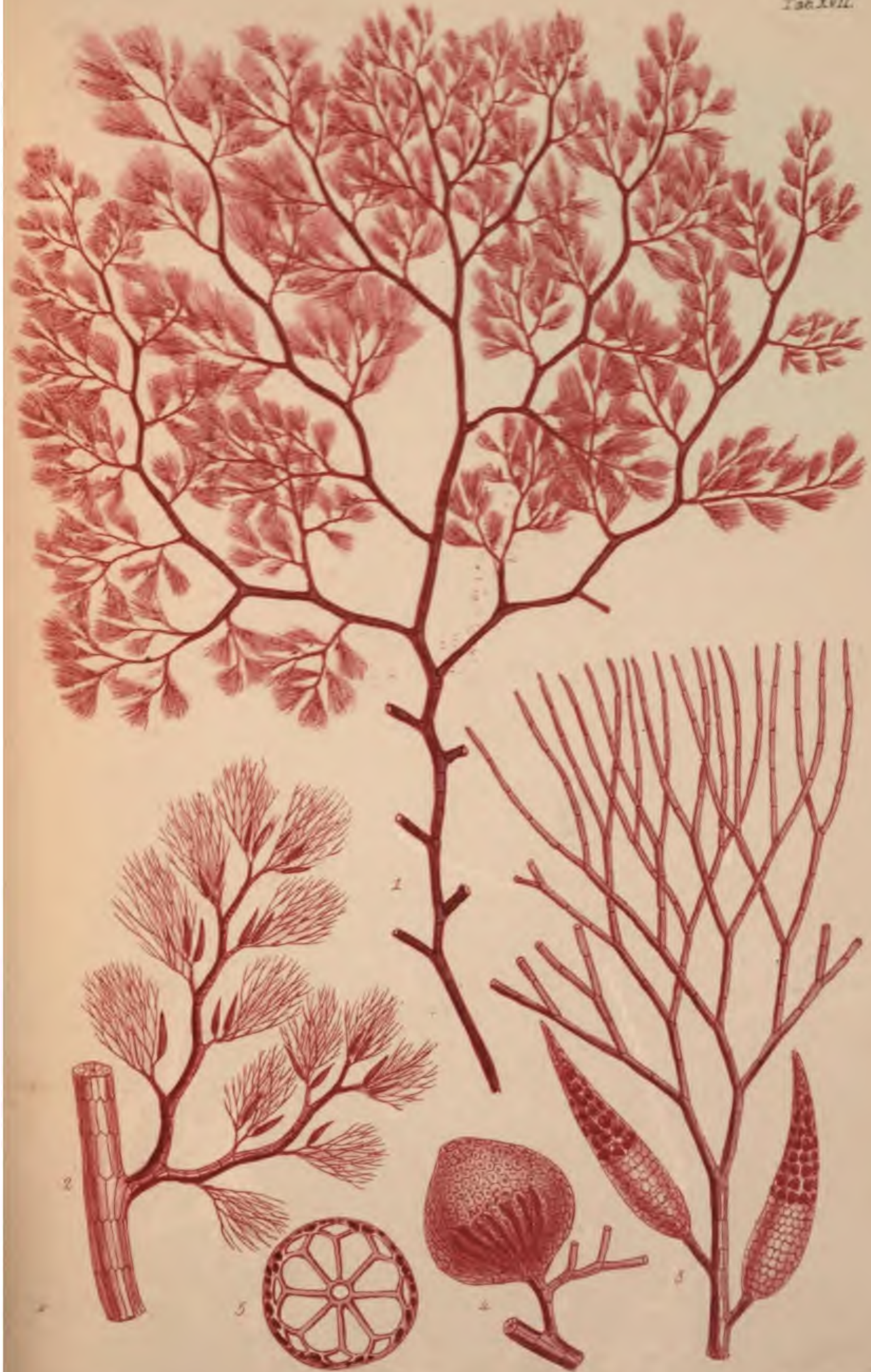
P. versicolor



W. H. H. del et lith.

P. monilifera

Tab. XVII.

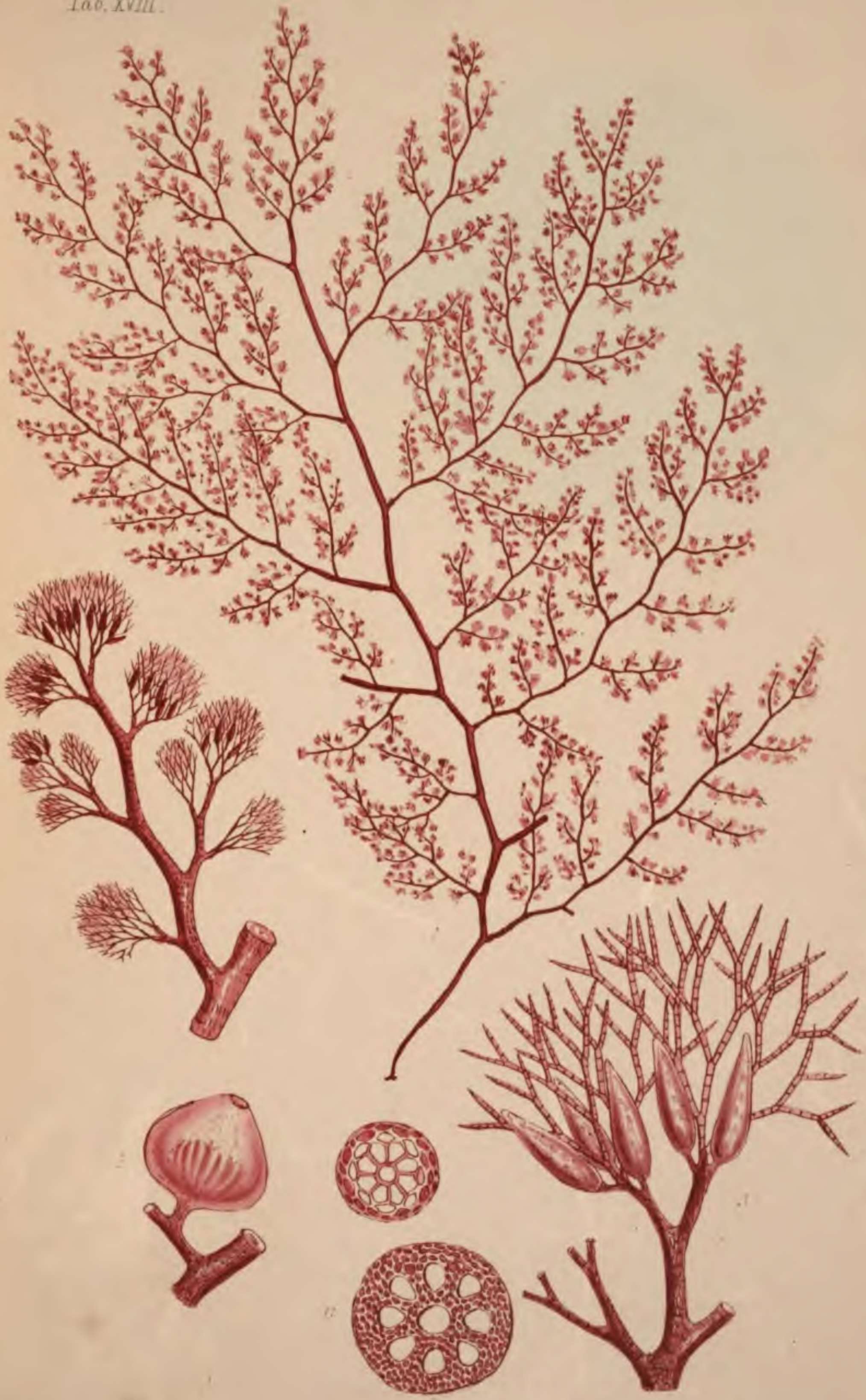


W.H.H. del. et lith.

Reeve imp.

Dasya gunniana.

Tab. XVIII.

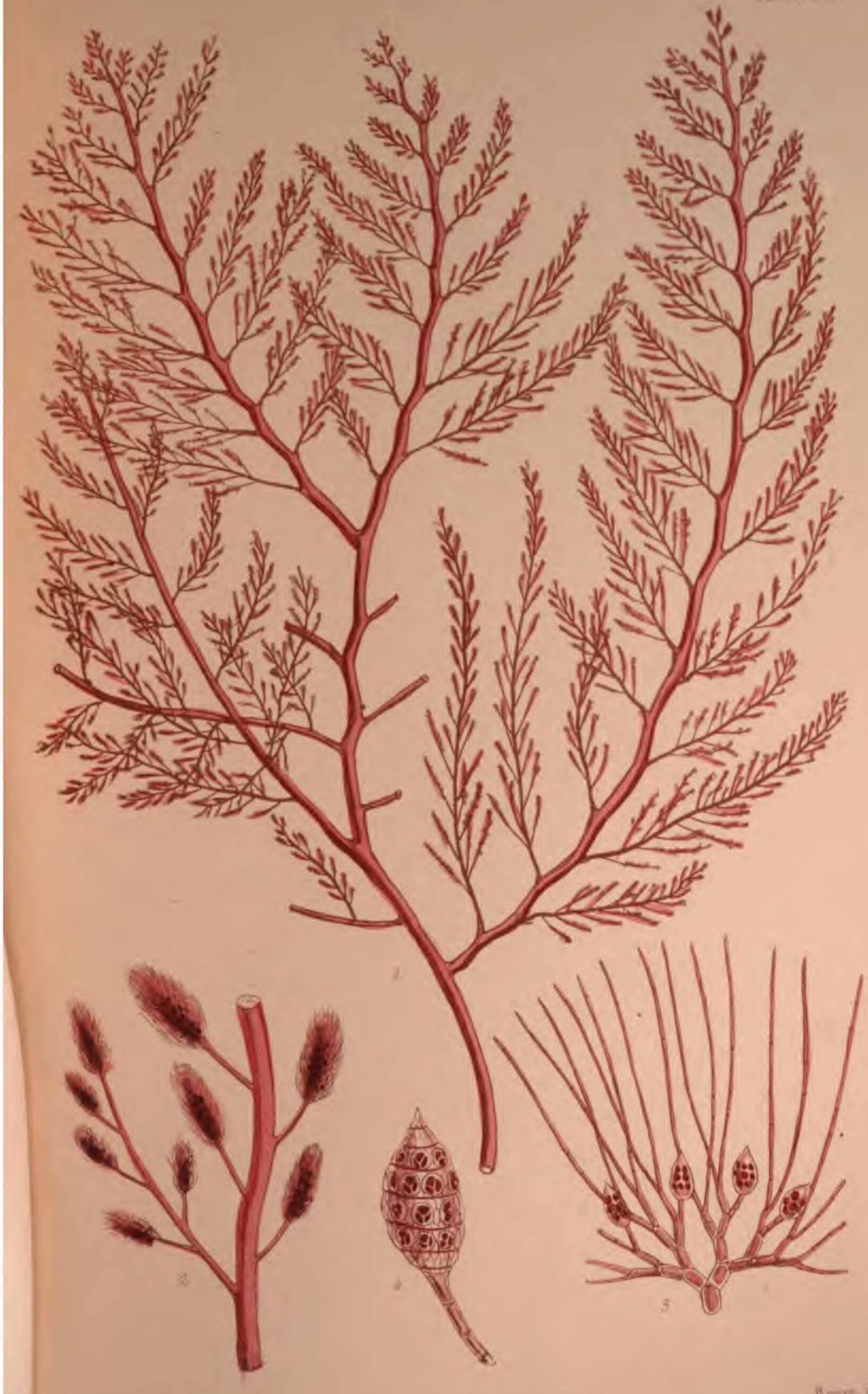


W.H.H. del. et lith.

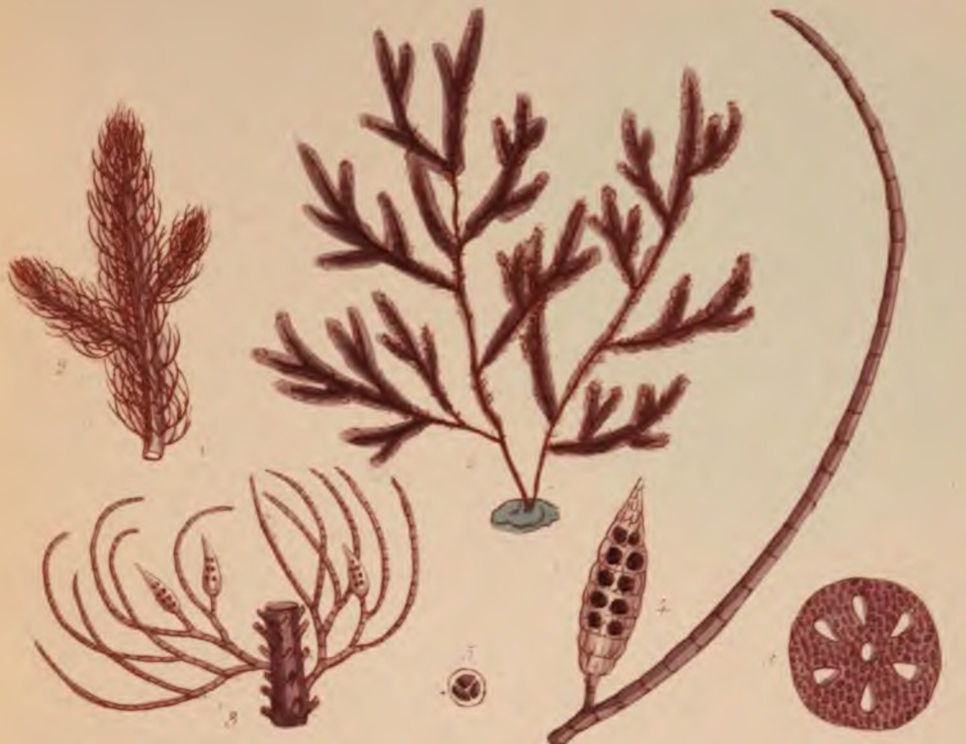
[illegible] imp.

Dasya Lawrenciana.

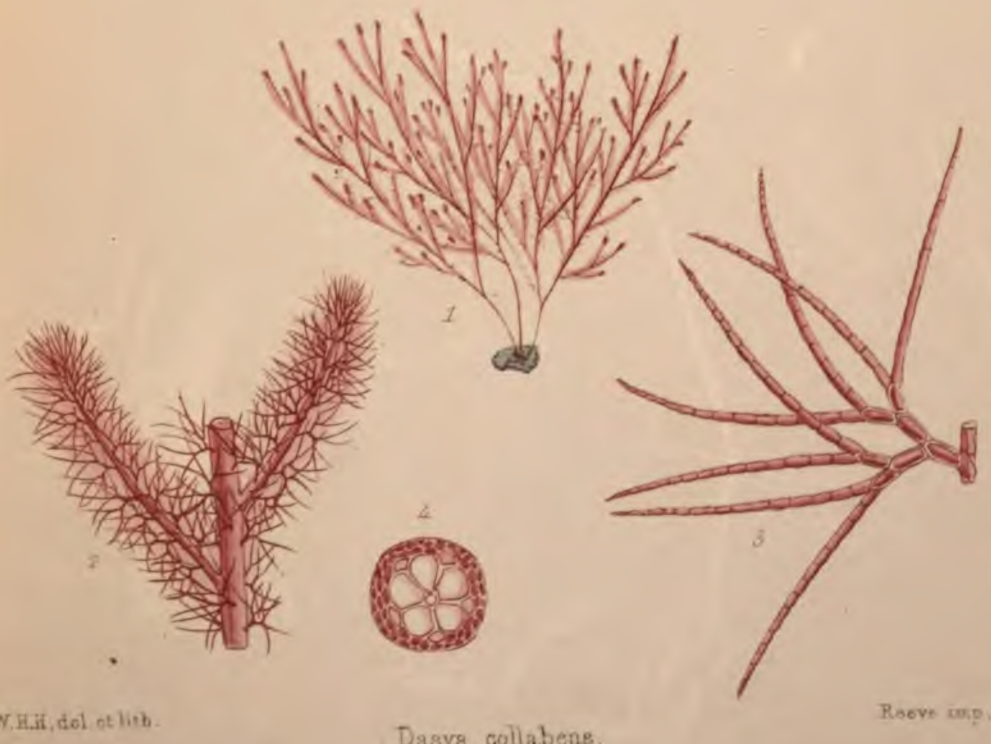
Tab. XXII.



W.H.H. del. et lith. Dasya naccarioides. Reeve, imp.



Dasya scoparia.

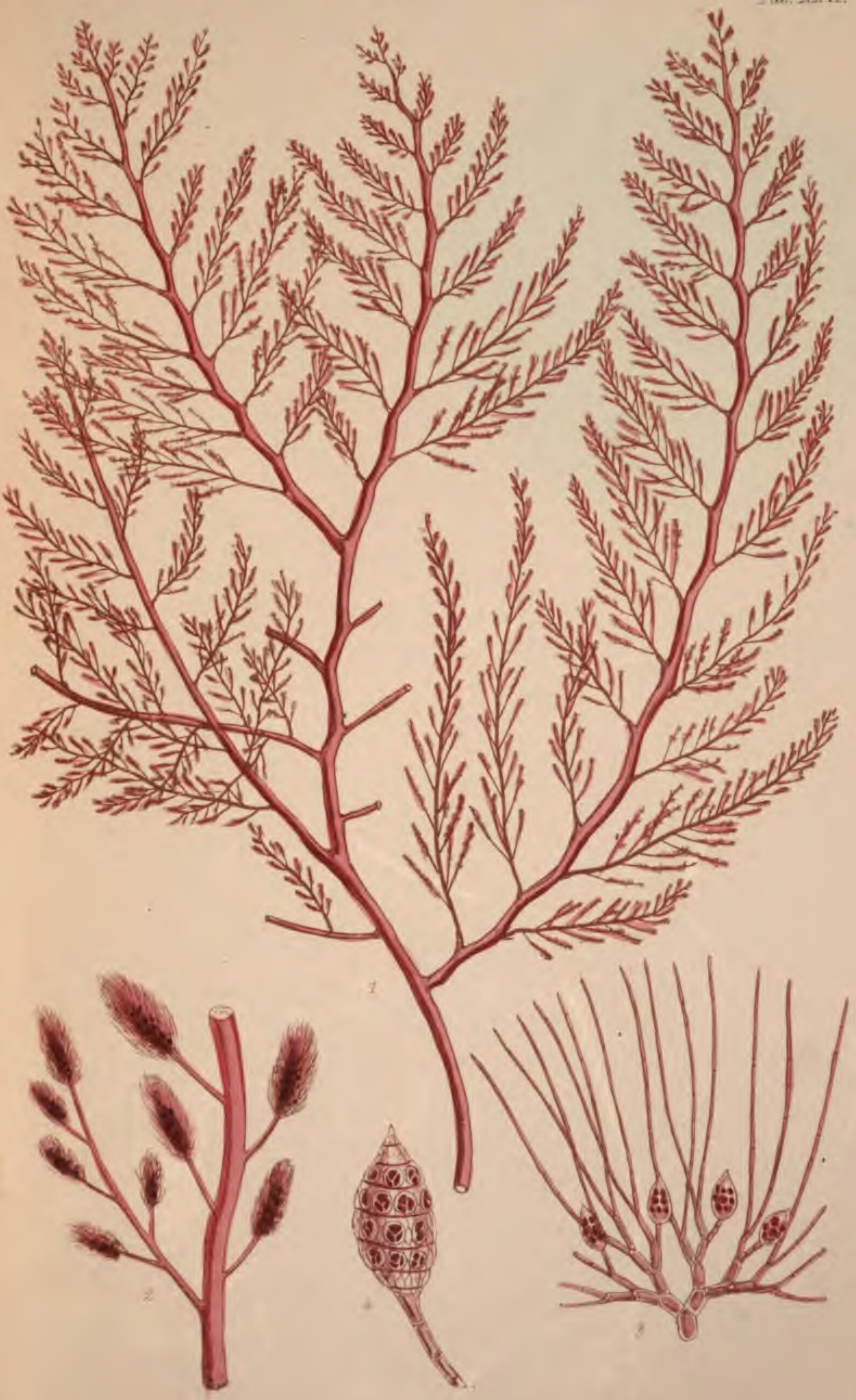


W.H.H. del. et lith.

Dasya collabens.

Reeve imp.

Tab. XXII.

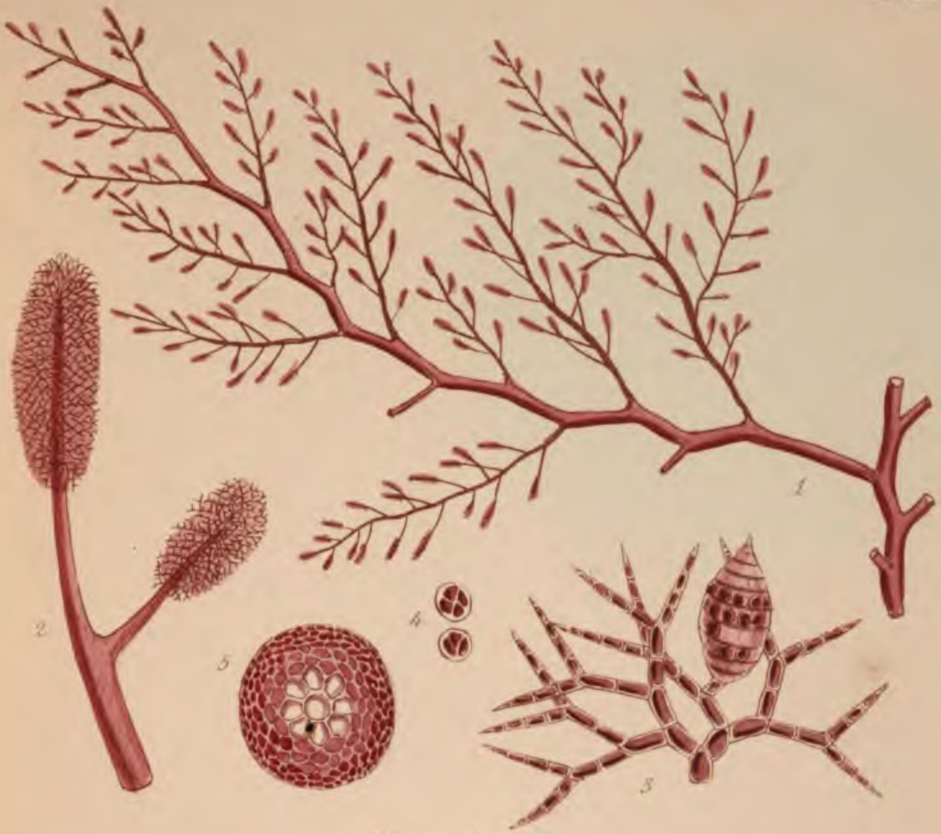


W.H.H. del. et lith.

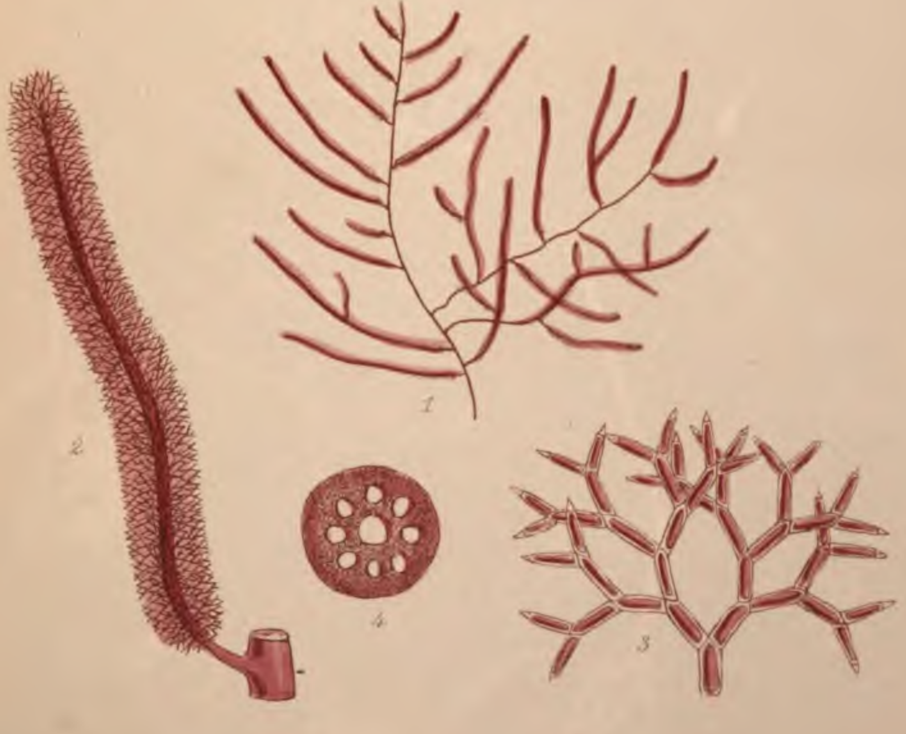
Reeve, imp.

Dasya naccarioides

Tab. XXIII.



Dasya elongata.

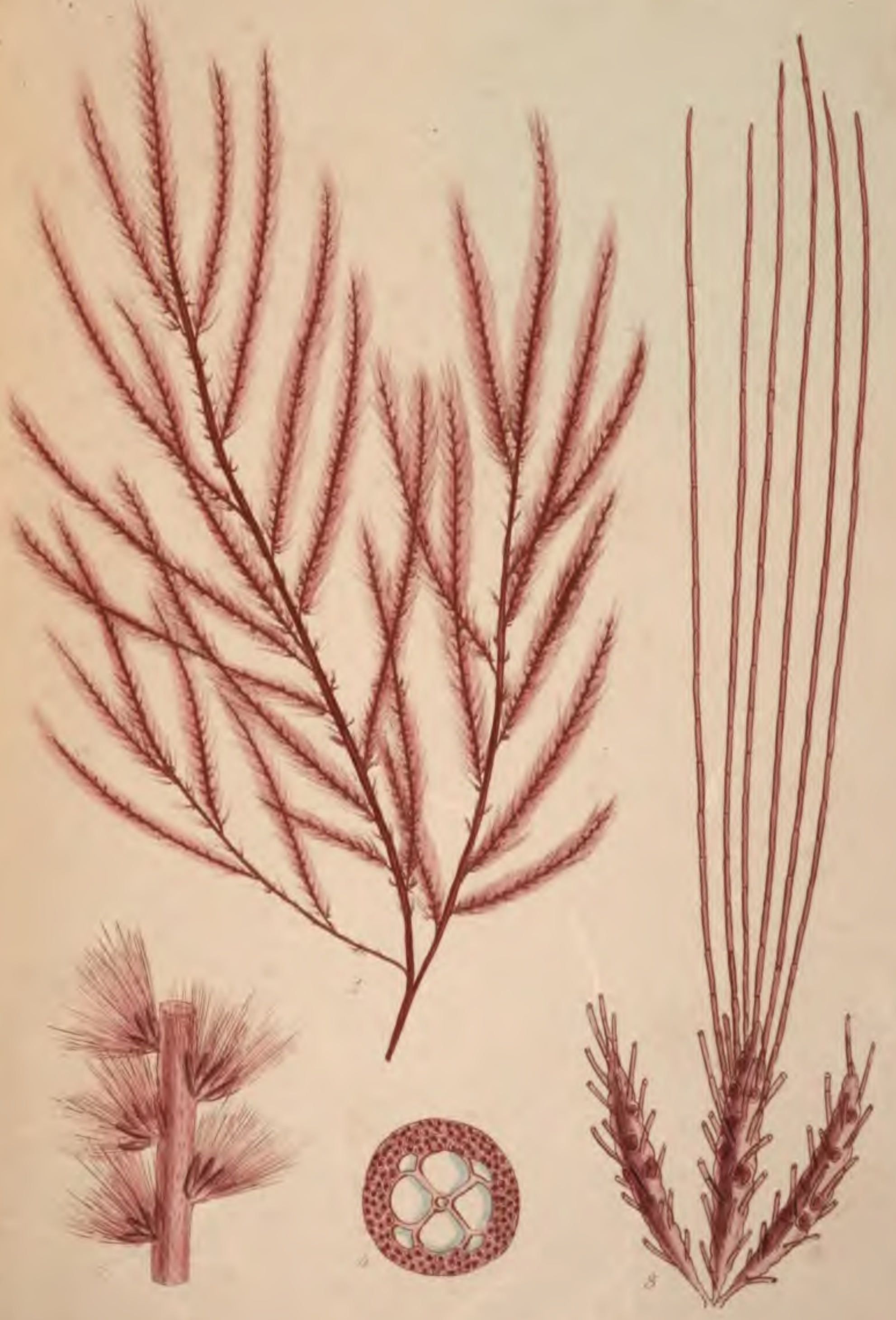


W.H.H, del et lith.

Reeve, imp.

Dasya velutina.

Tab. XXV.



W.H.H. del. et lith.

Dasya bolbochæte

Reeve, imp.

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BEING

FIGURES AND DESCRIPTIONS

OF

MARINE PLANTS, COLLECTED ON THE SHORES OF THE CAPE OF GOOD
HOPE, THE EXTRA-TROPICAL AUSTRALIAN COLONIES, TASMANIA, NEW ZEALAND, AND THE ANTARCTIC REGIONS;

DEPOSITED IN THE

HERBARIUM OF THE DUBLIN UNIVERSITY.

BY

WILLIAM HENRY HARVEY, M.D., M.R.I.A.,
Keeper of the Herbarium of the Dublin University and Professor of Botany to the Dublin Society.

LONDON:
REEVE, BENHAM, AND REEVE, KING WILLIAM STREET, STRAND.

1849.

and bearing spores only near its apex, but emitting from its sides three or four smaller stichidia in a sort of raceme. This modification of fruit is, perhaps, sufficiently important to ground a separate genus upon, for which the name *Lophothalia* is proposed.

Tab. 24. DASYA VERTICILLATA. Fig. 1. A branch:—*of the natural size.* 2. Portion of one of the lesser branches, clothed with ramelli and bearing racemes of stichidia. 3. One of the racemes stripped of most of its ramelli. 4. Section, showing the whorled insertion of the ramelli. 5. Cross section of a smaller branch. 6. Cross section of the stem:—*all more or less magnified.*

1. DASYA (*Lophothalia*) bolbochæte, *Harv.;* caule crassiusculo longissimo glabro inarticulato pluries alterne ramoso, ramis virgatis simplicibus inarticulatis ramellis monosiphoniis simplicibus penicillatis vestitis, ramellis e ramulo bulbiformi (demum sæpe in stichidio mutato) enatis, articulis ramellorum diametro 5–6-plo longioribus, stichidiis solitariis v. sæpissime fasciculatis simplicibus fusiformibus ramellis densissime vestitis. *Harv. in Lond. Journ. Bot.* vol. iii. p. 434. (TAB. XXV.)

HAB. George Town, Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond six to fourteen inches long, or more, three or four times branched in an alternate manner, the larger and smaller branches all virgate, long, simple and straight, densely clothed with pencilled, simple ramelli, 2–3 lines in length, which spring from minute bulb-like ramuli, disposed quadrifariously on the stem, at distances of from half a line to a line apart. These bulb-like ramuli are eventually, in fertile specimens, changed into stichidia, merely becoming larger without alteration of form or loss of their ramelli. They are sometimes solitary, but more frequently tufted. A transverse section of the stem shows four large tubes surrounded by a thick and dense cellular periphery.

The original specimen, described in the Journal of Botany, was in a young state, and its characters not perfectly developed. Mr. Gunn has since transmitted several others in a more perfect state, and in fine fruit. From one of these my figure is taken. The ramelli, which are very fragile, in the young plant, so as to break into separate joints, on the slightest touch, become, in a more advanced stage, flexible and tenacious. The habit is very similar, at first sight, to that of *Wrangelia nobilis,* but the microscopic characters of these plants are widely different.

Tab. 25. DASYA BOLBOCHÆTE. Fig. 1. Part of a frond:—*of the natural size.* 2. Segment of a branch. 3. A tuft of stichidia, partially denuded of their ramelli. 4. Cross section of the stem.

SUBGENUS 4. STICHOCARPUS,* *Ag.*

12. DASYA (*Stichocarpus*) hormoclados, *J. Ag.;* caule crasso elato indiviso glaberrimo

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* See Ag. Sp. Alg. vol. ii. p. 116, in note. This group was first recognised by Gray, in his Arrangement of Brit. Plants under the name *Ellisius,*—a name too like the older *Ellisia.* Afterwards by Greville under that of *Asperocaulon,* a Latin-Greek compound, and applicable to but one species. Kutzing has recently called it *Trichothamnion.* But if the names proposed by Gray and Greville be rejected, the right of priority surely attaches to the excellent one here adopted from Agardh.

inarticulato sensim attenuato decomposite ramosissimo, ramis erecto-patentibus subquadrifariis basi et apice attenuatis alterne 2–4-pinnatim divisis majoribus inarticulatis, minoribus plus minus articulatis polysiphoniis (articulis diametro æqualibus), pinnulis ramellos alternos distichos monosiphonios subulatos emittentibus, articulis ramellorum diametro 2–3-plo longioribus ad genicula constrictis, terminali acuminato, ceramidiis urceolatis. D. hormoclados, *J. Ag. in Linn.* vol. xvi. p. 32.

Dasya Agardhiana. *Harv. MSS. in Herb.* (Tab. XXVI.)

Hab. New Holland, *Herb. Binder.* Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond tree-like, eight to ten inches high, a line in diameter below, thickest towards the middle, somewhat tapering to the base, and much attenuated upwards, very smooth, bare of branches for an inch or two, thence to the apex bushy, with long, alternate, more or less distinctly quadrifarious branches, the lowermost of which are an inch asunder, the upper gradually closer, and finally much crowded. *Branches* three or four times compounded in an alternate pinnate manner; the larger ones opake, the smaller more and more articulate, and those that produce the ramelli pellucidly jointed, their joints being as long as broad, marked with about three tubes. *Ramelli* simple, contracted at the base, tapering to a fine point, their lower and upper joints short, the middle ones twice or thrice as long as broad, and all contracted at the dissepiments. *Ceramidia* urceolate, with wide mouths, shortly stalked. *Colour*, a fine crimson. *Substance* flaccid, adhering to paper.

A very fine species; Mr. Gunn's specimen is so much larger, of stronger growth, and more bushy than that described by Agardh, that I had at first considered it to belong to a different species, which I intended to name in honour of the founder of the genus. But after an attentive examination of the original specimen, preserved in the Herbarium of Senator Binder, of Hamburgh, who most liberally forwarded to me for inspection his entire suite of this genus, I am unable to detect any characters of sufficient importance to found a species upon. Mr. Gunn has sent but a solitary specimen, which was mixed with *D. ceramioides*, to which it outwardly bears considerable resemblance.

Tab. 26. Dasya hormoclados. Fig. 1. A branch; *of the natural size.* 2. Small branch. 3. Ramuli and ceramidia. 4. Ramuli. 5. Apex of ramulus. 6, 7. Sections of large branches:—*all magnified.*

13. Dasya (*Stichocarpus*) ceramioides, *Harv.;* caule crasso elato indiviso glaberrimo inarticulato sensim attenuato decomposite ramoso, ramis erecto-patentibus distichis tri-pinnatis majoribus inarticulatis minoribus plus minus articulatis polysiphoniis, articulis sursum incrassatis diametro 4–5-plo longioribus, pinnulis ramellos distichos alternos monosiphonios subulatos emittentibus, articulis ramellorum diametro 2–3-plo longioribus ad genicula constrictis, terminali acuminato, ceramidiis ore producto, stichidiis minimis ovato-acuminatis longissime pedicellatis. D. ceramioides, *Harv. in Lond. Journ. Bot.* vol. iii. p. 435. (Tab. XXVI.)

Hab. George Town, Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond several inches long, one third of a line in diameter below, gradually attenuated, several times irregularly pinnated. *Branches* flexuous, not distinctly jointed, but somewhat constricted at intervals of 4–5 diameters, triply pinnate; the pinnulæ more evidently articulated, the articulation swelling upwards. *Ramelli* simple, erecto-patent, contracted at the base, tapering to a very acute point; their joints twice or thrice as long as broad, contracted at the dissepiments. The *Stichidia* are exceedingly minute, and borne on long, slender jointed pedicells issuing from the ramelli; they produce tetraspores in a triple row. The *Ceramidia* are ovato-urceolate, with a very prominent mouth. *Colour*, a fine crimson. *Substance* rather flaccid.

Certainly nearly related to the preceding, but differing in many points, which the figure sufficiently explains.

Tab. 26. DASYA CERAMIOIDES. Fig. 1. A branch; *of the natural size*. 2. Small branch, bearing stichidia. 3. Branchlet with a ceramidium. 4. Ceramidium. 5. Branchlet with stichidia. 6. Stichidium, on its stalk. 7. Tetraspore. 8, 9. Sections of small branch and of stem.

14. DASYA (*Stichocarpus*) pectinata, *Hook. fil. et Harv.;* setacea, rigida, purpurea, fronde basi nuda superne distiche decomposito-pinnata, pinnis articulatis tri-striatis pectinato-pinnatis, ramulis (vel pinnulis) simplicibus alternis brevibus subulatis articulatis monosiphoniis, articulis diametro sesquilongioribus, ceramidiis urceolatis pedicellatis. (TAB. XXVII.) *Hook. fil. et Harv; in Hook. Fl. Antarct.* vol. ii. p. 482.

HAB. Cape Horn, *Dr. Hooker*. Falkland Islands, *Mrs. Capt. Sulivan*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

A beautiful plant, with the habit of *Bonnemaisonia asperagoides*.

Tab. 27. DASYA PECTINATA. Fig. 1. Frond (drawn from Mrs. Sulivan's largest specimen); *of the natural size*. 2. Branchlets with pectinate ramuli. 3. A ceramidium. 4. Articulations of the stem, with ramulus. 5. Transverse section of the stem. 6. Section of a small branch:—*all magnified*.

15. DASYA (*Stichocarpus*,) subsecunda, *Suhr;* fronde pusilla setacea pellucide articulata bipinnata, pinnis creberrimis elongatis horizontalibus, pinnulis perbrevibus multipartitis, ramulis dichotomo-secundis trivenosis, articulis diametro subbrevioribus quadrivenosis, siphonibus septem, tubo centrali magno. (TAB. XXVII.) *Suhr in Herb. Binder.*)

HAB. Valparaiso, *Herb. Binder*. (*v. s. in Herb. Binder.*)

Fronds 1–2 inches high, with an undivided stem closely pinnated with numerous horizontal branches of unequal length, long and short being intermingled without order. *Pinnæ* set with alternate pinnules less than a line in length, but multifid in a manner between secund and dichotomous. *Articulations* visible in all parts of the frond, rather shorter than broad, marked with four broad tubes. *Siphons* 7, surrounding a wide central cavity. *Colour*, a clear carmine.

Tab. 27. DASYA SUBSECUNDA. Fig. 1. Frond; *of the natural size*. 2. Portion of a pinna or branch. 3. Fertile ramulus with (empty) stichidia. 4. Transverse section of the stem:—*all magnified*.

17. DASYA (*Stichocarpus*) pellucida, *Harv.;* fronde pusilla capillari pellucide articulata vage ramosa, ramis paucis alternis erectis indivisis pinnulatis, pinnulis minutis multipartitis, ramulis dichotomo-secundis trivenosis, articulis diametro duplo brevioribus, siphonibus septem tubo centrali angusto. (TAB. XXVII.)

HAB. Cape of Good Hope, both at Green-Point and Muysenberg, *W.H.H.* (*v. v. et s. in Herb. T.C.D.*)

Frond tufted about an inch high, but slightly branched; the branches alternate, undivided and very erect, closely beset with short multifid dichotomous branchlets. *Articulations* visible in all parts of the frond, and very short. *Colour*, a full carmine.

Very similar to the last in microscopic characters; but very different in ramification, and from a widely distant shore.

Tab. 27. DASYA PELLUCIDA. Fig. 1. A tuft; *of the natural size.* 2. Part of a branch. 3. Ramulus with stichidia. 4. Transverse section of stem:—*all magnified.*

GENUS 20. BOSTRYCHIA, *Mont.*

Frons filiformis, ramosa, inarticulata, tessellato-punctata, tubo centrali articulato cellulis uni-pluriseriatis endochromaticis superficiem versus brevioribus circumdato. *Ramuli* sæpissime involuti v. uncinati. *Cellulæ* superficiales, quadratæ. *Ceramidia* (mihi ignota.) *Stichidia* terminalia, lanceolata, tetrasporas triangule divisas duplici serie foventia.—Algæ pusillæ, livido-purpureæ, *boreales, tropicæ*, v. *australes*, nunc marinæ vix demersæ, nunc etiam amphibiæ vel aquæ dulcis incolæ.

SUBGENUS 1. EUBOSTRYCHIA:—*cellulæ periphericæ pluriseriatæ.*

1. BOSTRYCHIA Binderi, *Harv.*; fronde unciali bi-tri-pinnatim ramosa, pinnis alternis patentissimis, inferioribus brevibus pinnulatis, superioribus elongatis simplicibus furcatisve bipinnatis, pinnis horizontalibus, pinnulis brevissimis spinæformibus. (TAB. XXVIII.)

DASYA dubia, *Suhr in Herb. Binder.*

HAB. Port Natal. *Krauss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

Frond an inch high, tripinnate, the lower pinnæ not a line in length, horizontal, simply pinnulate, closely set, alternate; the upper elongate, simple or branched, bipinnate; all the branching very patent, and all the ultimate pinnules short and spine-like. *Colour*, a dark, lurid-purple.

Tab. 28. BOSTRYCHIA BINDERI. Fig. 1. A frond; *of the natural size.* 2. The same, *magnified.* 3. Pinnulated branchlet. 4. A transverse section of the stem:—*both magnified.*

2. BOSTRYCHIA calamistrata, *Mont.*; fronde unciali terete-compressa decumbente hic illic fulcris radicante vage ramosa, ramis patentibus bipinnatis, pinnis alternis erecto-patentibus involutis, pinnulis tenuissimis monosiphoniis articulatis inflexis. *Mont. Hist.* Cuba, p. 36. t. 4. f. 1.

DASYA crispa, *Suhr in Herb. Binder.*

HAB. Port Natal. *Krauss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

About an inch long. *Fronds* prostrate, attached at intervals by stout hold-fasts which issue from the under surface, alternately or irregularly branched. *Branches* closely set, very patent, of various lengths, the shorter ones simply, the longer doubly-pinnate. *Pinnæ* closely set, regularly alternate, erecto-patent, strongly involute when dry, pectinated with very slender ramuli formed of a single row of cells, that is, articulate. *Articulations* very short. *Stem* and branches opake, composed of irregularly placed (not transversely zoned) cells.

The Port Natal specimens are furnished with rootlets along the main branches, and are rather more robust than those from Cuba. In other respects the plants are the same, as I have ascertained by a specimen obligingly furnished to me by my friend Dr. Montagne.

SUBGENUS 2. STICTOSIPHONIA, :—*cellulæ periphericæ uniseriatæ.*

3. BOSTRYCHIA Hookeri, *Harv.;* caulibus indivisis curvatis apice involutis, ramis lateralibus abbreviatis alternis subquadrifariis erecto-patentibus inferioribus subulatis simplicibus furcatisve superioribus alterne multifidis, ramulis subulatis acutis erectis, axillis acutis, stictis subtriseriatis, stichidiis lanceolatis acutis ramulos minores terminantibus. *Hook. Fl. Antarct.* vol. ii. p. 483. t. 186. f. 2.

HAB. Hermite Island, Cape Horn, and the Falkland Islands, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

An inch or more in height, densely tufted, rigid, dark purple. *Stem* mostly undivided, furnished throughout its length with lateral branches. *Branches* sometimes all about a line long and but slightly divided: sometimes the lowest are of this length and character, the upper 2–4 lines long and repeatedly branched. All the ramuli are subulate and erect, or erecto-patent. The tips of the stem and main branches are generally strongly involute. Under the microscope the branches and ramuli appear beautifully marked with three rows of dark purple, dot-like cells.

4. BOSTRYCHIA fastigiata, *Hook. fil. et Harv.;* caulibus multifidis fastigiatis apicibus involutis, ramis æquilongis curvatis, ramulis alternis subulatis furcatis vel alterne multifidis, axillis acutis, stictis 3–4 v. pluri-seriatis. *Hook. Fl. Antarct.* vol. ii. p. 483.

HAB. Hermite Island, Cape Horn, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Half an inch high, fastigiate, divided from the base into many principal branches, red-purple. *Stem* scarcely any; branches long, curved, set with simple or multifid ramuli, much incurved at the tips.

Perhaps only a variety of *B. Hookeri.*

5. BOSTRYCHIA vaga, *Hook fil. et Harv.;* caulibus flexuosis vage dichotome ramosis, ramis paucis nudis simplicibus filiformibus subcapillaribus arcuatis medio incrassatis apicibus incurvis, ramulis nullis, axillis patentibus, stictis minutis multiseriatis, stichidiis longissime pedunculatis lanceolatis acutis. *Hook. Fl. Antarct.* vol. ii. p. 484. t. 186. f. 1.

HAB. Christmas Harbour, Kerguelen's Land, on rocks and stones above high water-mark, and in damp places at a considerable distance from the sea; abundant, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds half an inch to an inch high, densely tufted, very flexuose, irregularly branched. *Colour* blackish purple. *Dots* small, in 6–8 transverse rows.

6. Bostrychia mixta, *Hook. fil. et Harv.*; caulibus pinnatis, pinnis patentibus simplicibus vel furcatis vel alterne ramulosis, ramulis subulatis divaricatis, apicibus strictis vel vix involutis, axillis latis, stichidiis curvatis ramulos terminantibus.

Hab. On rocks near high-water mark. New Zealand, *Dr. Hooker*. Shore at Muysenberg, Cape of Good Hope. *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Tufts widely spreading, intricate. *Fronds* half an inch high, simple, pinnate, the pinnæ simple or slightly branched. *Colour*, a blackish purple. *Substance* rigid.

Genus 21. POLYZONIA, *Suhr.*

Frons filiformis, ramosa, articulata, polysiphonia, cellulis superficialibus hexaedris. *Ramuli* distichi, plano-compressi, foliiformes, haud involuti, deorsum integerrimi, sursum varie incisi v. dentati, transversim zonati. *Ceramidia* ovata, ad axillas ramulorum sessilia. *Stichidia* simplicia v. pinnatim composita, lanceolata, sæpe cristata, pedicellata, supra axillaria. Algæ pusillæ, *australes*, *Jungermanniarum* facie, algis majoribus adnascentes, purpureæ v. amœne roseæ.

* *Ramuli applanati, sursum dentati.*

1. Polyzonia elegans, *Suhr*; surculo repente radicante, caulibus erectis vage et parce ramosis, ramis simplicibus patentibus, ramulis (*foliis*) horizontali-patentibus recurvisque nervo evanescente percursis oblongis acutis deorsum integerrimis sursum inciso-dentatis, dentibus tribus deltoideis acutis; ceramidiis ovatis axillaribus. (Tab. XXVIII.) *Suhr, in Fl.* 1834. vol. ii. p. 739. f. 15.

Hab. Parasitical on *Gelidium*. Algoa Bay, *Eklon*; *Bowerbank*. Port Natal, *Krauss*. Swan River, *Preiss*. (*v. s. in Herb. T. C. D. comm. cl. Bowerbank, Krauss, Pappè.*)

One or two inches high, slightly branched, the branches long and simple. Both surculus, stem, and branches are regularly set with distichous, vertical, horizontally inserted, laterally compressed ramuli, resembling the vertical leaves of a *Jungermannia*, oblong, acute, with the upper edge cut into three broad, deltoid acute lobes or teeth. *Colour*, a dull purple. *Ceramidia* sessile in the axils of the ramuli, attached to the ramulus, not to the stem. *Stichidia* I have not seen.

Tab. 28. Polyzonia elegans. Fig. 1. Fronds growing on Gelidium aculeatum; *of the natural size*. 2. Part of a frond. 3. Ceramidium in situ. 4. Leaf. 5. Transverse section of stem:—*all magnified.*

2. Polyzonia cuneifolia, *Mont.*; surculo repente, caulibus erectis alternatim ramosissimis, ramis ramulisque patentibus simplicibus elongatis, ramulis (*foliis*) horizontali-patentibus trapeziformibus basi cuneatis apice abrupte truncatis laceris deorsum integerrimis sursum subtrilobis, lobis dentatis, stichidiis lanceolatis cristatis simplicibus pinnatisque. *Mont. Voy. Pol. Sud. Bot. Crypt.* p. 143. *Hook. fil. Fl. Antarct.* vol. i. p. 181. t. 76.

Hab. Lord Auckland's Group and Campbell's Island; abundant on the stem of the larger Algæ, *D'Urville*; *Dr. Hooker*. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Primary fronds creeping over the surface of Algæ, attached at intervals by discs, articulated and furnished with distichous alternate foliaceous ramuli. *Stems* erect, 4–5 inches long, filiform, undivided, furnished with numerous long simple alternate branches, which in luxuriant specimens bear a shorter secondary branch. Every part of the stem and branches is set at short intervals with alternate, distichous foliaceous ramuli. *Ramuli* or leaves plane, inserted vertically, trapeziform, broadly cuneate at base, lacero-dentate at the truncated apex, irregularly toothed on the upper margin, the teeth denticulate, quite entire on the lower margin. *Ceramidia* attached to the basal lobe of a deeply cut ramulus, sessile, ovate-urceolate. *Stichidia* lanceolate supra-axillary, at first simple, afterwards pinnately composed, each stichidium crested with a few processes. *Colour*, a beautiful clear pink. *Substance* membranaceous.

A very charming plant, by much the finest and most beautiful of the genus. It resembles a miniature *Adiantum*.

3. POLYZONIA adiantiformis, *Dne.;* minuta, vage ramosa, ramis patentibus, foliis trapezoideis deorsum integerrimis, sursum apicique truncato dentato-laceris, dentibus minutis. *Dne. Nouv. Ann. Sc. Nat.* vol. xvii. p. 363.

HAB. New Zealand, parasitical on *Marginaria.* (*v. s. frustulum in Herb. T. C. D. comm. cl. Decaisne.*)

The only specimen I have seen of this plant appears to me to be immature. The branches are prostrate on the *Marginaria* and attached to it by discs, and I regard them therefore as surculi, from which erect stems probably rise at a more advanced period of growth. The branches are clothed with leaves very similar to those of *P. cuneifolia* in form, but of very much smaller size, and composed of far more minute cells. In more perfect specimens it is probable that these characters would be greatly modified.

* * *Ramuli compressi, subulati, sursum pectinato-partiti.*

4. POLYZONIA incisa, *J. Ag.;* surculo decumbente radicante, caulibus gracilibus erectis pinnatis, pinnis crebris elongatis patentibus alternis distiche-pinnulatis, pinnulis (ramulis v. *foliis*) deorsum integerrimis sursum in laciniis 4–5 e basi latiori lanceolato attenuatis mucronatis pectinato-partitis, ceramidiis ovatis in axillis foliorum sessilibus, stichidiis extra-axillaribus lanceolatis cristatis. *J. Ag. in Linn.* vol. xv. p. 24.

HAB. Parasitical on Algæ. New Holland, *J. Agardh.* Tasmania, *Gunn, Jeannerett,* &c. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds rising from creeping surculi. *Stems*, an inch high, closely pinnate with spreading branches, which are distichously *plumulate* with minute comb-like ramuli (or leaves) simple on their lower margin, pectinated on the upper. *Laciniæ* somewhat lanceolate, suddenly acuminate and ending in a bristle-shaped hyaline mucro, articulate, tristriate. *Ceramidia* broadly ovate, obtuse, sessile in the axils of the pectinate ramuli, the ramulus which bears this fruit being pushed out of its place, but not metamorphosed. *Stichidia* lanceolate, each containing 4–5 large tetraspores, crested with minute subulate or pectinate ramuli.

5. POLYZONIA Colensoi, *Hook. fil. et Harv.;* surculo radicante, caulibus gracilibus alterne divisis, ramis paucis elongatis alternis distiche pinnulatis, pinnulis (*foliis*) deorsum subfalcatis integerrimis sursum in laciniis quinque anguste-subulatis sensim attenuatis acutis pectinato-partitis, ceramidiis (*ignotis*), stichidiis lanceolatis cristatis.

HAB. New Zealand, *Rev. W. Colenso.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Stems 1–2 inches high, alternately divided; the branches patent, long and simple, closely pinnulated with pectinate ramuli. *Laciniæ* of the ramuli gradually tapering from base to apex, slender. *Stichidia* simple, lanceolate crested.

A taller, less branching and more robust species than the preceding.

6. Polyzonia Sonderi, *Harv.;* surculo radicante, caulibus erectis crassiusculis alterne ramosis, ramis distiche pinnulatis, pinnulis (*foliis*) deorsum falcato-recurvis integerrimis sursum in laciniis 4–5 late-subulatis sensim attenuatis acutis pectinato-partitis

Polysiphonia inversa, *Sond. Pl. Preiss*, vol. ii. p. 180.

Hab. Swan Piver, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

More robust than either of the preceding, but smaller and more branching than the following.

7. Polyzonia Harveyana, *Dne.;* surculo radicante, caulibus erectis compressis crassiusculis simplicibus distiche pinnulatis, pinnulis (*foliis*) deorsum falcato-recurvis integerrimis sursum in laciniis late-subulatis sensim attenuatis subacutis vel obtusis pectinato-partitis, ceramidiis (*ignotis*), stichidiis ovato-lanceolatis lobatisque. *Dne. in Raoul, Pl. Nov. Zeal.* p. 32.

Hab. Parasitic on *Gelidium lucidum.* New Zealand, *M. Raoul; Rev. W. Colenso.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Stems erect, almost always simple, robust, half an inch to an inch in length, closely pinnated with distichous comb-like ramuli (or pectinate leaves) which issue horizontally and curve backwards so that their lower edge is falcate; their upper edge deeply cut into four and the rudiment of a fifth broadly subulate rather obtuse lacinia. *Stichidia* supra-axillary generally three lobed, sometimes simple, the lobes crested.

A larger and more robust plant than any of the preceding. These four species must either all be held distinct, though closely allied; or else considered, as I formerly regarded them, different forms of one very variable species. Placed side by side under the microscope, they all look different; but it is nearly impossible so to define them in words as to make their descriptions intelligible. I fear that a further acquaintance with the subject will cause all to be again united into one.

Genus 22. LEVEILLIA, *Dne.*

Frons filiformis, ramosa, polysiphonia, cellulosa, ramis pinnulatis. *Pinnulæ* distichæ, applanatæ, foliiformes, apice sæpe barbatæ, areolatæ, circinatim involutæ. *Ceramidia* ignota. *Stichidia* sessilia, arcuata, spiraliter involuta, apice quandoque foliosa, axillaria, tetrasporas singula serie dispositas foventia. Algæ pusillæ, sæpius *tropicæ*, *Jungermanniarum* facie, algis majoribus adnascentes, purpureæ.

1. Leveillia Schimperi, *Dne.;* "ramis sparsis pinnatim lobatis, lobis distichis subimbricatis, foliolis rotundatis sæpius apice penicillatis mucronulatis, receptaculis arcuatis superne haud raro foliosis." *Dne. Archiv. Mus.* vol. ii. p. 161. t. 6. *Sond. in Pl. Preiss.* vol. ii. p. 111.

HAB. Swan River Colony, *Preiss; fide Sonder l. c.*

I have seen no austral specimen of this, or of any of the following species.

2. LEVEILLIA comosa, *Dne. in Nouv. Ann. Sc. Nat.* vol. xi. p. 376. (*sine char.*)

HAB. West Coast of New Holland, *Mus. Paris.*

Probably the same as Preiss's plant.

3. LEVEILLIA ciliata, *Dne.;* "fronde ramosa, ramulisque circinatis, pinnulis distiche alternis rotundatis dentato-ciliatis." *Dne. in Nouv. Ann.* vol. xvii. p. 363.

HAB. South Coast of Chili, on *Desmarestia; Mus. Paris.*

4. LEVEILLIA pectinata, *Dne.;* "fronde ramosa, ramulisque circinatis, pinnulis distiche alternis linearibus integerrimis." *Dne. in Nouv. Ann.* vol. xvii. p. 363.

HAB. New Holland, on *Amphiroa anceps; Mus. Paris.*

Genus omissum:—post *Claudeam*, adde:

GENUS 1.* MARTENSIA, *Hering.*

(*Hemitrema*, R. Br.)

Frons membranacea, plana, avenia, areolata, tenerrima, sub margine incrassata, fenestratim perforata, foraminibus pluriseriatis rete elegantissimum marginale formantibus. *Ceramidia* ovata, apice pertusa, externa, reticulo affixa, fasciculum sporarum pyriformium foventia. *Tetrasporæ* triangule partitæ in soris definitis per frondis discum sparsis collectæ; v. in laminis verticalibus reticuli immersæ. Alga elegantissima, *Austro-Africana*, amœne rosea, flabelliformis, habitu inter *Claudeam* et *Nitophyllum* media. *Conceptacula* Rhodomelearum.

1. MARTENSIA elegans, *Hering, Ann. Nat. Hist.* vol. viii. p. 92. *Hook. Ic.* t. 697. (TAB. XLII.)

HEMITREMA Kraussii, *R. Br. MSS. Endl. 3rd Suppl.* p. 50.

HAB. Port Natal, South Africa, *Dr. Krauss; Dr. Stanger; Dr. Gueinzius.* (*v. s. in Herb. T. C. D. comm. cl. inv.*)

Fronds in dense tufts, one inch and a half high, flabelliform, the lower half formed of a delicate, expanded membrane, rounded at the summit, composed of large, polygonal cells; the whole of the upper margin bordered with a net-work, which is at first very narrow, but gradually widens till it equals in length the membranous portion of the frond. The net is much thicker than the leafy part, and is composed, as it were, of vertical, laterally compressed laminæ, connected together at both surfaces by cross bars. The outer edge of the net is always perfectly even, forming a narrow border of membrane similar to that of the frond, but thicker; and the growth appears to take place between the inner edge of this border, and the uppermost meshes of the old net. Having only seen dried specimens it may be rash to decide on the exact mode in which the net is formed. To me it appears that the portion immediately beneath the marginal band contracts at regular intervals along the whole breadth of the frond until a line of holes is formed; these holes enlarge till they reach a certain size, at which they remain, and a new row of holes then begins to be formed above them, adding a new band to the net. And thus the net increases, row by row; the holes next the circumference being youngest, and consequently of smallest size. *Ceramidia* ovate, attached to the meshes of the net, prominent, containing a tuft of pear-shaped spores. *Tetraspores* either collected into sori (like those of a *Nitophyllum*) on the membranous disc of the frond, or, more commonly, scattered through the vertical laminæ of the net.

Since the publication of this work commenced I have received through the kindness of *Dr. Stanger*, and also from *Dr. Gueinzius*, much more perfect specimens of this beautiful plant than I possessed when my former opinion of its affinity to the *Delesserieæ* was formed. Hering's account of the conceptacular fruit was the chief ground of that opinion, to which the nature of the frond, so like that of *Nitophyllum*, gave additional strength. An examination of the conceptacle, however, proves a much closer affinity with *Claudea* than with *Nitophyllum*.

Tab. 42. Martensia elegans. Fig. 1. Fronds:—*the natural size*. 2. Portion of the net. 3. Small part of the same, with imbedded tetraspores. 4. Part of the membrane with a sorus. 5. A tetraspore. 6. Portion of the net, with ceramidium. 7. Vertical section of ceramidium:—*all magnified*.

FAM. 2. CHONDRIEÆ, *J. Ag.*

CHONDRIEÆ, *J. Ag. in Linn.* vol. xv. p. 20. *Alg. Medit.* p. 108. *Dne. Class.* p. 64. (partim). LOMENTARIEÆ, *Endl. Gen. Pl. 3rd Suppl.* p. 42. *Mont. Pole Sud. Crypt.* p. 122. SPHÆROCOCCOIDEÆ, *Dne. l. c.* (partim). LAURENCIEÆ, *Harv. in Lond. Journ. Bot.* vol. iv. p. 539.

Frons linearis, filiformis vel compressa, rarissime plana, angusta; nunc continua, solida; nunc cava, intus diaphragmatibus divisa, succo repleta, e cellulis polygonis, pluriseriatis superficiem versus minoribus conflata; nunc filis discretis percursa, nunc axi v. costa fibroso-cellulari. *Cellulæ* periphericæ sæpius minutæ, inordinatæ, rarissime in fila horizontalia connexæ. *Fructus* duplex; 1, *Conceptacula* externa (*Ceramidia* dicta) ovata vel hemispherica, intra pericarpium cellulosum apice pertusum fasciculum sporarum pyriformium ad placentam centralem basilarem affixarum continentia. 2, *Tetrasporæ* per ramulos v. totam frondem sparsæ, triangule quadripartitæ.

A small and exceedingly natural family, nearly related to the *Rhodomeleæ*, especially in technical characters, but differing chiefly in natural habit, or the structure of the frond. Both families have *ceramidia* as their conceptacular fruit; but in *Rhodomeleæ* the tetraspores are either contained in *stichidia*, or they form definite sori immersed in the frond. In *Chondrieæ*, on the other hand, the *tetraspores* are scattered through the ramuli, and even through the branches. With the exception of this slight difference the two families coincide in their fructification.

But in the structure and habit of the frond, the differences are more strongly marked. In this family we no longer find the delicate, reticulated membranes, or the zoned and articulate filiform frond, composed of large cells radiating round a centre, which peculiarly distinguish the *Rhodomeleæ*. These characters are exchanged for a filiform or compressed frond of much denser structure, and very frequently of a cartilaginous substance, though sometimes almost gelatinous; either solid or hollow; now continuous, now contracted at intervals and internally chambered by diaphragms or membranous partitions stretched across the cavity. The chambers are sometimes traversed by threads and almost always filled with watery mucus. Very generally the frond is pinnate, frequently much compounded; in some few the ramuli are verticillate, and in others, but still more rarely, dichotomous. The apices in the majority are peculiarly blunt or truncate; but some genera are characterized by subulate acute ramuli, distichously placed along the branches. The colour, though in some cases a brilliant rosy red, is very often lurid-purple, fading to green and yellow when the plants are exposed to sunshine. None turn black in drying. Almost all decompose rapidly in fresh water, especially if again moistened after having been dried.

The point chiefly noticeable in their geographical distribution, is the wide dispersion of almost all the genera, and of a large number of the species. *Chrysymenia*, *Laurencia*, *Chylocladia*, and *Asparagopsis*, are cosmopolitan, and several species of the first three genera are dispersed through all temperate latitudes, north and south. *Champia* is scarcely distinct from *Chylocladia*; *Cladhymenia* from *Laurencia*; and *Delisia* from *Bonnemaisonia*; and *Thysanocladia* would probably be more naturally associated (as *M. Montagne* proposes) with *Gelidium*.

CONSPECTUS GENERUM CHONDRIEARUM.

* *Frons cava, succo repleta; tubo continuo.*

I.—Chrysymenia.

* * *Frons cava, succo repleta; tubo diaphragmatibus interrupto, in loculos diviso.*

II.—Champia. *Frons* firma. *Diaphragmata* creberrima, filis numerosis connexa.

III.—Chylocladia. *Frons* lubrica, membranacea. *Diaphragmata* vix filis connexa.

* * * *Frons solida, cellulosa, compressa v. plana; ramulis obtusis v. basi attenuatis.*

IV.—Laurencia. *Frons* teres v. compressa, cartilaginea.

V.—Cladhymenia. *Frons* plana, membranacea.

* * * * *Frons solida, cellulosa, cylindracea vel compressa, ramulis subulatis distichis marginata.*

VI.—Asparagopsis. *Frons* decomposito-pinnata, ramulis setaceis, subarticulatis. *Ceramidia* longe pedicellata, sparsa.

VII.—Delisia. *Frons* decomposito-pinnata, ramulis subulatis. *Ceramidia* ad apices ramorum sessilia.

* * * * * *Frons solida, plana v. compressa subcostata; costa fasciculo compacto filorum composita. Ceramidia* (spuria) *in frondis paginam sessilia, aggregata.*

VIII.—Thysanocladia. (*Genus potius ad Cryptonemeas, prope Gelidium, tollendum*).

* * *

Genus 1. CHRYSYMENIA, *J. Ag.*

Frons tubulosa, succo repleta, tubo continuo filis paucissimis percurso; peripheria e cellulis pluriseriatis composita, interioribus majoribus elongatis, exterioribus sensim minoribus, superficialibus minutissimis. *Ceramidia* ovata v. conica, fasciculum sporarum continentia. *Tetrasporæ* triangule divisæ, in ramulos immersæ, sparsæ. Algæ *cosmopolitanæ*, amœne roseæ, pinnatim compositæ, sæpissime distichæ, gelatinoso-membranaceæ, strato superficiali hyalino lubricatæ; ramulis obtusis.

1. Chrysymenia clavellosa, *J. Ag.;* fronde gelatinoso-membranacea pinnatim composita ramosissima, ramis alternis crebris sæpissime distichis, ramulis distichis v. undique insertis basi attenuatis; ceramidiis conicis. *J. Ag. Alg. Medit.* p. 107. *Harv. Phyc. Brit.* t. cxiv. etc.

Hab. On rocks, stones, and the small algæ, between tide-marks. Tasmania; Sulivan's Cove, *Dr. Lyall!* George Town, *Mr. Gunn!* (*v. v. et s. in Herb. T. C. D.*)

The Australian specimens are very much branched, four to six inches high, with ramification less regular than common; but the species is well known to be a very variable one.

2. Chrysymenia secunda, *Hook. fil. & Harv.;* fronde (pusilla) membranacea flaccida rosea intricata ramosissima, ramis curvatis ramulisque patentibus sæpissime secundis linearibus obtusis equalibus, ramulis distantibus paucis brevibus. *Hook. & Harv. Lond. Journ. Bot.* vol. iv. p. 548.

Hab. New Zealand, *M. Raoul.* (*v. s. in Herb. Hook.*)

Fronds densely tufted, two inches high, setaceous, much branched; the branches generally secund and arched. *Colour* rosy red. *Substance* delicate, adhering to paper. *Fruit* unknown.

3. Chrysymenia obovata, *Sond.;* "caule teretiusculo dichotomo ramentis obovatis undique sparsis obtecto." *Sond. in Pl. Preiss.* vol. ii. p. 176.

Hab. Swan River, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl Binder.*)

Frond three or four inches long or more, dichotomous; the branches densely set with vesicular, obovate or balloon-shaped ramuli, four to six lines long. *Fruit* unknown. Allied to *Ch. uvaria*, but larger, with differently shaped ramuli.

Genus 2. CHAMPIA, *Ag.*

Frons tubulosa, succo repleta, cylindracea v. compressa, filis articulatis numerosis percursa, tubo diaphragmatibus crebris membranaceis interrupto, in loculos diviso; peripheria e cellulis uni- vel pluriseriatis minutis composita. *Ceramidia* ovata v. conica, fasciculum densissimum sporarum continentia. *Tetrasporæ* triangule divisæ, in ramulos immersæ.

Algæ *Capenses* et *Australasicæ*, purpureo-sanguineæ, parum ramosæ, e radicibus ramosis ortæ, parasiticæ v. sæpius rupestres. Genus vix ac ne vix e *Chylocladia* diversum.

1. **Champia** lumbricalis, *Ag.;* fronde cylindracea cartilaginea simplici v. parum ramosa ramis sparsis secundisve sæpius fasciculatis virgatis simplicibus, ramulis brevibus dense fasciculatis; ceramidiis ovoideis. *Ag. Sp. Alg.* vol. ii. p. 114. (Tab. XXX.)

Hab. Cape of Good Hope, common. (*v. v. et s. in Herb. T. C. D.*)

Fronds rising from branching fibres, densely tufted, four to twelve inches high, two lines in diameter, cylindrical, tapering at the base, simple or rarely divided, erect, furnished with a few long, virgate, scattered or secund, or more generally tufted, very erect branches, which are either simple or once forked near the base, somewhat curved or arching in the direction of the principal stem. These branches, as well as the main stem, bear nest-like tufts of short ramuli at intervals of an inch or more. *Ramuli* very unequal in size in the same tuft. *Ceramidia* large, ovoid, with very thick walls, containing a large tuft of conical spores. *Tetraspores* immersed in the articulations of the ramuli. *Colour*, a full, dark purplish red. *Substance* firm and rigid; the cells full of watery juice. The walls of the frond are thick, composed of many rows of minute cells, which gradually become smaller towards the circumference.

Tab. XXX. Champia lumbricalis. Fig. 1. A small specimen:—*the natural size.* 2. Ramulus with ceramidia. 3. Section of ceramidium. 4. Spores. 5. Ramulus with tetraspores. 6. Tetraspores. 7. Vertical thin slice of frond:—*all more or less magnified.*

2. **Champia** compressa, *Harv.;* fronde (brevi) compressa pinnatim v. subbipinnatim ramosa, pinnis patentibus basi attenuatis lineari-oblongis obtusis plerumque oppositis, pinnulis paucis distantibus oppositis alternisve; articulis diametro quadruplo brevioribus. *Harv. Gen. S. A. Pl.* p. 402. (Tab. XXX.)

Hab. On rocks near low-water mark, at the Cape of Good Hope, *Ecklon*. Muysenberg, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds one to two inches high, one to two lines wide, strongly compressed, erect, pinnate and bipinnate, the pinnæ tapering at the base, obtuse, linear-oblong. *Pinnules* few, patent, opposite or alternate, distichous. Walls of the frond and diaphragms both composed of single rows of large cells. *Ceramidia* conoidal, scattered. *Tetraspores* densely scattered through the articulations of the stem and branches. *Colour* dark red, iridescent under water. *Substance* membranaceous.

Tab. XXX. Champia compressa. Fig. 1. Fronds:—*the natural size.* 2. Part of a ramulus with ceramidia. 3. Spores. 4. Part of a ramulus with tetraspores. 5. Tetraspores. 6. Longitudinal semi-section of the frond:—*more or less magnified.*

3. **Champia Tasmanica,** *Harv.;* fronde (elata) compressa subbipinnatim ramosa, pinnis elongatis patentibus plerumque oppositis basi attenuatis, pinnulis clavatis distantibus oppositis vel alternis nunc ad axillas pinnarum fasciculatis; articulis diametro duplo brevioribus. *Harv. in Hook. Lond. Journ. Bot.* vol. iii. p. 407. t. 19. *Sond. in Pl. Preiss.* vol. ii. p. 177.

Hab. Tasmania; at Port Arthur, *Mrs. Smith;* Circular Head, *Mr. Gunn;* Swan River, *Mr. Backhouse, M. Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Hooker; cl. Backhouse.*)

Root, a mass of branching fibres. *Fronds* tufted, four to six inches high, about half a line in diameter, compressed, simple, or divided near the base, furnished throughout with opposite, or sometimes ternate or whorled, rarely alternate branches, from whose bases several clustered ramuli occasionally spring. *Branches* much contracted at their insertion, one to two inches long, simple, either bare of ramuli or having a few opposite, or scattered, distant pinnules, filiform, obtuse, by no means tapering to the apex. *Fruit* unknown. *Articulations* half as long as broad. *Colour*, a fine, purplish-pink.

GENUS 3. CHYLOCLADIA, *Grev.*

(*Lomentaria*, Endl.)

Frons tubulosa, gelatinoso-membranacea, succo repleta, cylindracea, nunc filis (paucissimis) percursa, articulato-constricta, v. moniliformis; tubo diaphragmatibus membranaceis interrupto, in loculos diviso; peripheria e cellulis pauciseriatis minutis composita. *Ceramidia* hemispherica v. ovata, fasciculum densum sporarum continentia. *Tetrasporæ* triangule divisæ, in ramulos immersæ, sparsæ. Algæ *cosmopolitanæ*, roseæ v. purpurascentes, sæpius ramosissimæ, ramis pinnatis, v. verticillatis, v. dichotomis, plus minus ad diaphragmata arcte constrictis. *Substantia* tenera, mollis, in aqua dulci cito flaccescens.

* *Ceramidia hemispherica.*

1. CHYLOCLADIA capensis, *Harv.*; fronde atro-purpurea iridescente subcartilaginea simplici v. parum ramosa erecta, caule basi attenuato superne articulato-constricto articulis brevibus, ramis paucis elongatis simplicibus articulato-constrictis, ramulis verticillatis sparsisve, ceramidiis globosis. *Harv. Gen. S. A. Pl.* p. 400. (TAB. XXIX.)

HAB. Cape of Good Hope; Table Bay, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Fronds rising from branching fibres, three to four inches high, simple, or divided into a few principal branches, very slender and cylindrical at base, soon growing wider, and then regularly constricted upwards at short distances. *Branches* constricted like the main stem, and equalling it in diameter, generally furnished with short, obtuse, moniliform, mostly whorled ramuli. *Colour*, a dull, dark purple, reflecting rain-bow hues when seen under water. *Substance* firm and cartilaginous. *Ceramidia* very abundant, globose, densely covering the articulations of fertile ramuli. *Tetraspores* also crowded in the articulations.

Nearly allied to *C. Mediterranea*, J. Ag.; also to *C. kaliformis*, from which it chiefly differs in size, colour, and substance.

Tab. XXIX. CHYLOCLADIA CAPENSIS. Fig. 1. Frond;—*the natural size.* 2. Ramulus with ceramidia. 3. Vertical section of ceramidium. 4. Spores. 5. Ramulus with tetraspores. 6. Tetraspores:—*all magnified.*

* * *Ceramidia ovata v. conoidea.*

2. CHYLOCLADIA affinis, *Hook. fil. & Harv.*; majuscula, caule subindiviso, ramis laterali-

bus ramulisque articulato-constrictis oppositis v. verticillatis sparsisve elongatis iterum compositis, articulis ramulorum diametro brevioribus, ceramidiis magnis ovatis.—β. *arcuata;* ramis ramulisque sparsis arcuatis apice sæpe hamatis. *Hook. fil. et. Harv. in Lond. Journ. Bot.* vol. vi. p. 402. (Tab. XXIX.)

Chylocladia kaliformis, *Harv. Lond. Journ.* vol. iii. p. 444. *excl. syn.*

Hab. Tasmania. At George Town, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond twelve inches high or more, with an undivided fistulous stem, subconstricted at irregular intervals, and furnished throughout with opposite, alternate or whorled, very patent branches. *Branches* long, gradually shorter upwards, tapering to either end, articulato-constricted at short, regular distances, bearing numerous opposite alternate or whorled secondary branches, and sometimes a third and fourth series of smaller ramuli. *Articulations* of the ramuli moniliform, shorter than their diameter. *Ceramidia* large, conoidal.

This has the size and habit of *C. kaliformis*, from which it is at once distinguished by its essentially different *ceramidia.*

Tab. XXIX. Chylocladia affinis. Fig. 1. A branch: *of the natural size.* 2. Ramulus with ceramidium. 3. Ramulus with tetraspores. 4. A tetraspore:—*all magnified.*

3. Chylocladia parvula, *Grev.;* pusilla, cæspitosa, caule flexuoso irregulariter ramoso, ramis ramulisque articulato-constrictis sparsis, articulis ramulorum diametro equalibus v. duplo longioribus, ceramidiis magnis ovatis. *Mont. Pol. Sud. Crypt.* p. 123. *Harv. Phyc. Brit.* t. 210. *etc.*

Hab. New Zealand. Akaroa, *D'Urville; Raoul.* (*v. v. et s. in Herb. T. C. D. comm. cl. Decaisne ex parte cl. Raoul.*)

Fronds densely tufted, 2–4 inches high, irregularly branched and bushy, without evident stem: the branches and ramuli scattered and patent. *Articulations* of ramuli short, in some specimens scarcely moniliform, in others clearly so. *Colour,* a dull pale red, sometimes purple. *Ceramidia* large, conoidal.

A cosmopolitan species. The specimens from Akaroa agree closely with those from Europe and North America.

4. Chylocladia Novæ Zelandiæ, *Hook. fil. et Harv.;* stipite brevi cylindracea mox in frondem lato-linearem ampliato, caule (juniori tantum viso) simplici compresso articulato-constricto, ramis oppositis verticillatisve basi attenuatis, articulis diametro duplo brevioribus, tetrasporis per ramulos sparsis. *Hook. fil. et Harv. Lond. Journ.* vol. iv. p. 541.

Hab. New Zealand; Bay of Islands, *Dr. Lyall.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Young specimens only seen. The largest is three inches long and about a line in breadth, but it had only commenced the formation of lateral branches. The diaphragms are at intervals of half the breadth of the frond, and connected, as in *Champia,* by numerous rope-like threads. Possibly it would be more correctly referred to the latter genus.

* * * *Species inquirenda.*

5. Chylocladia Tasmanica, *Harv. in Hook. Lond. Journ.* (*sine char.*) vol. iii. p. 444.

Hab. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Two imperfect and half decomposed specimens of a fine *Chylocladia,* probably new, but closely allied to *C. articulata,* constitute all that is at present known of this plant. One of these specimens is preserved in the Hookerian Herbarium, the other in that of the University of Dublin. In ramification *C. Tasmanica* resembles *C. articulata,* but the substance is more gelatinous and the size greater. The frond is irregularly dichotomous, with very patent axils, constricted at each node; the upper divisions umbellate, 4 or 5 new branches springing from the top of an older one, and these from their apices, giving birth to saccate ramuli.

Genus 4. LAURENCIA, *Lamour.*

Frons solida, cartilaginea, cylindracea v. compressa, pinnatim composita, disticha, continua, e cellulis polyhedris versus superficiem minoribus constituta. *Ceramidia* ovata, fasciculum laxum sporarum foventia. *Tetrasporæ* triangule divisæ, in ramulos immersæ, sparsæ.—Algæ *cosmopolitanæ* purpureæ v. viridescentes, raro roseæ, rupestres et algicolæ, sæpissime pinnatæ, raro subdichotomæ. *Ramuli* nunc lineares, nunc ad basin maxime attenuati, obtusissimi v. raro acuti.

* *Frons compressa.*

1. Laurencia elata, *Harv.;* fronde compressa angusta elata sanguinea pluries pinnata, pinnis pinnulisque erecto-patentibus alternis, pinnulis linearibus elongatis, ceramidiis apicalibus. *Harv. in Lond. Journ.* vol. vi. p. 401. *L. pinnatifida var. elata, Ag. Spec. Alg.* vol. i. p. 337. *Sond. Pl. Preiss.* vol. ii. p. 177. (Tab. XXXIII.)

Hab. Tasmania, very common, *Mr. Gunn.* Swan River, *Mr. Backhouse; Preiss.*

Fronds 12–18 inches high, not a line in diameter, compressed, sometimes nearly plane, many times pinnate. *Primary* branches long, 2–3 times pinnate, the lower pinnæ longest, all the divisions alternate and erecto-patent. *Pinnules* ¼–½ inch long, linear truncate. *Colour* a fine deep red, changing to orange in fresh water. *Ceramidia* terminating the pinnules, ovate.

A much more branching plant than *L. pinnatifida,* proportionately more slender, and of a brighter colour. It seems to be the prevalent form in Tasmania, if we may judge by its frequency in collections.

Tab. 33. Laurencia elata. Fig. 1. A branch; *of the natural size.* 2. Apex of a fertile ramulus, with ceramidia. 3. Tuft of spores; *all magnified.*

2. Laurencia concinna, *Mont.;* fronde cartilaginea sanguinea compresso-plana pinnata v.

bipinnata, pinnis pinnulisque oppositis patentibus obtusis crenato-dentatis v. pinnatifidis, dentibus v. laciniis simplicibus verrucosis. *Mont. Pol. Sud.* Crypt. p. 126. t. 14. f. 1.

HAB. Port Natal, *S. Africa; Dr. Stanger; Dr. Gueinzius.* (*v. s. in Herb. T. C. D. comm. cl. Inv.*)

Frond (in the Port Natal specimens) 2–4 inches high, undivided, or forming several principal branches set with opposite very patent or horizontal pinnæ, the middle of which are longest, the rest gradually shorter towards either end. *Pinnæ* when young crenate, then dentate and finally pinnatifid, with very obtuse, simple or warted opposite laciniæ. *Colour*, a rather bright sanguineous red, changing to orange in fresh-water.

Closely related to *L. pinnatifida*, especially the var. *Osmunda* but separable by its constantly opposite and very patent pinnæ. Our specimens do not precisely accord with M. Montagne's figure, but so nearly resemble it that I cannot consider our plants distinct.

3. LAURENCIA botryoides, *Gaill.;* fronde cartilaginea livido-purpurea compressa pyramidali bipinnata, pinnis alternis erecto-patentibus (circumscriptione lanceolatis), pinnulis conoideis ellipsoideisve petiolatis verrucosis, verrucis granuliferis. *Turn. Hist. Fuc.* t. 178, *Hook. fil. et Harv. Lond. Journ.* 3. p. 444.

HAB. Australia; Kent Island, *R. Brown, Esq.* Tasmania, *Mr. Gunn, Rev. Mr. Ewing,* &c. New Zealand, *Dr. Hooker.* Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Frond 6–10 inches high. *Stem* simple or divided into several principal branches. *Branches* alternate, bipinnate, the pinnæ long, compressed, closely pinnulated with short, conoidal or linear oblong warted ramuli. The warts sometimes exist as mere swellings containing tetraspores; sometimes as cups; but I have not seen any proper ceramidia. *Colour*, dull livid purple.

A variable plant. The New Zealand specimens are not half as large as those from Tasmania. It is sometimes not easy to distinguish some varieties from *L. pinnatifida.*

4. LAURENCIA pinnatifida, *Lamour.;* fronde cartilaginea livido purpurea compressa bi-tripinnata, pinnis pinnulisque alternis erecto-patentibus, pinnulis linearibus simplicibus v. lobatis, ceramidiis lateralibus. (*Harv. Phyc. Brit.* t. 55. *etc.*)

HAB. The temperate parts of the Southern Ocean. Cape of Good Hope. New Zealand, *Dr. Lyall.* Falklands, *Dr. Hooker.* (*v. v. et s. in Herb. T. C. D.*)

Frond from 2–12 inches high, compressed, from 1–3 lines in breadth, dull purple or greenish, repeatedly pinnate or pinnatifid.

Very variable in size and ramification. More common in the northern than in the Southern Ocean.

* * *Frons teres; ramuli cylindracei* (*basi attenuati.*)

5. LAURENCIA cæspitosa, *Lamour.;* fronde subterete bipinnatim ramosa, pinnis pinnulisque erectis cylindraceis obtusis alternis oppositisque, pinnulis basi subconstrictis apice truncatis simplicibus crebris. *Mont. Pl. Cell. Canar.* p. 154. and Ch. pinnatifida, γ. *Ag. Sp. Alg.* vol. i. p. 339.

Hab. Falklands and Auckland Isles, *Dr. Hooker*. Chili, *Herb. Paris*. (*v. v. and s. in Herb. T. C. D.*)

Densely tufted, 2–6 inches high, cylindrical or somewhat compressed, decompound-pinnate. *Branches* densely set, shorter upwards, erect or erecto-patent, alternate, once or twice pinnate, the pinnules either opposite or alternate, very erect, slightly constricted at base. *Colour*, a dull dark purple, very lurid, fading to green.

Commonly considered a variety of *L. pinnatifida,* but more terete and of a darker colour. This is *L. hybrida,* Lenorm.; I follow M. Montagne in adopting Lamouroux's name.

6. **Laurencia** arbuscula, *Sond.;* "fronde terete erecta gracili subramosa, ramis patentibus alternis rarissime subopposititis intermediis longioribus, ramulis erectis oppositis cylindraceis obtusiusculis." *Sond. in Pl. Preiss.* vol. ii. p. 177.

Hab. Swan River, *Preiss*. (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

Fronds 2–3 inches high. *Branches* with a lanceolate outline, erecto-patent; ramuli erect or appressed, cylindrical, or slightly thickened upwards, a line long, simple or minutely cloven at the top. *Colour*, dull brownish-red.

7. **Laurencia** obtusa, *Lamour.;* fronde terete filiformi pluries pinnata, pinnis pinnulisque sæpissime oppositis subhorizontalibus, pinnulis cylindraceis obtusis simplicibus trifidisque, ceramidiis sessilibus sparsis. *Harv. Phyc. Brit.* t. 148. etc.

Var. *β.* pyramidalis; caulibus primariis longissimis, pinnis abbreviatis, pinnulis multifidis. —*L. Pyramidalis;* Bory.

Hab. Cape of Good Hope, Algoa Bay, *Mr. Bowerbank*. Tasmania, *Mr. Gunn*. Swan River, *M. Preiss*. Var. *β*, Algoa Bay. (*v. v. et s. in Herb. T. C. D.*)

Variable. *Fronds* 2–6 inches high or more, bitripinnate, cylindrical, all the divisions patent and generally opposite, sometimes ternate or quadrifarious. *Ramuli* short, horizontal, simple or multifid. Var. *β.* is a remarkable form, but intermediate specimens occur often in the same tuft with extreme ones. In these last the stems are 2–6 inches long, naked at base, densely pinnated above, the pinnæ from half an inch to an inch long and much divided.

8. **Laurencia** laxa, *Grev.;* "fronde cartilaginea lubrica terete filiformi flexuosa laxe bipinnatim ramosa; ramis remotis horizontalibus alternis apice leniter incrassatis; tetrasporis ramosis ad apices sparsis." *Turn. Hist. Fuc.* vol. iv. p. 15. t. 203.

Hab. Cape of Good Hope, *R. Brown, Esq.*

"*Frond* cylindrical, filiform, as thick as crow quill, two feet long, or perhaps much more, having a stem irregularly flexuose, once or twice dichotomous at uncertain distances, and beset with branches of the same nature as itself. *Branches* scattered, flexuose, irregularly dichotomous, having toward their apices a few horizontally patent branchlets about an inch long, and undivided, but bearing ramuli placed in a spirally alternate manner, 1–3 lines long, horizontal, simple, cylindrical, except that their apices, which are remarkably obtuse in the whole plant, are somewhat incrassated." *Turn. l. c. abridged.*

I am unacquainted with this plant, which is known to botanists only by the figure and description quoted above.

9. LAURENCIA gracilis, *Hook. fil. et Harv.*; fronde elata filiformi setacea flexuosa pinnatim ramosissima, ramis alternis longis virgatis simplicibus iterumve ramosis, ramulis horizontalibus alternis secundisve brevibus elongatisque cylindricis capitatis. *Hook. et Harv. in Lond. Journ.* vol. vii. p. 444. (*L. filiformis.*)

HAB. Hawkes Bay, New Zealand, *Rev. W. Colenso*, No. 640. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Allied to *L. obtusa* but very slender, with flexuous stems and branches, and alternate or secund ramuli. The ramuli are very variable in length, sometimes scarcely a line long, sometimes 6–8 lines or more.

10. LAURENCIA filiformis, *Mont.*; "fronde filiformi rosea inferne subdichotoma, ramis ramulos secundos simplices non fastigiatos emittentibus, tetrasporis triangule divisis in ramulos apice subincrassatos immersis." *Mont. Pl. Cel. Pol. Sud.* p. 125.

HAB. Tasmania, *Dubouzet.*

I am not acquainted with this plant.

11. LAURENCIA papillosa, *Grev.*; fronde terete bipinnata, pinnis elongatis oppositis alternisve, pinnulis brevissimis sæpius oppositis horizontalibus creberrimis apice verrucosis, ceramidiis congestis. *Fucus thyrsoides, Turn.* t. 19.

HAB. New Zealand, *Sir Joseph Banks.* (*v. s. in Herb. T. C. D.*)

Densely tufted, 4–6 inches high, bipinnate. *Pinnæ* close together, long, simple, set with short, crowded, warted pinnules, 1–3 lines long, simple or cloven, very obtuse, depressed or perforated at the apex, horizontally patent. *Colour*, a dark, blackish purple, fading to green.

Turner's figure is very characteristic, but represents a decaying specimen. I do not possess southern specimens, except from Mauritius. The species is common in the Mediterranean, as well as in the tropical ocean.

12. LAURENCIA Tasmanica, *Hook. fil. et Harv.*; fronde cartilaginea elata terete bi-tripinnata, ramis primariis (circumscriptione lanceolatis) alternis oppositisque patentibus, secundariis alternis apicem versus sensim minoribus, ramulis abbreviatis basi subconstrictis apice obtusis truncatis, ceramidiis aggregatis raro solitariis. *M. papillosa, Hook. et Harv. in Lond. Journ.* vol. vi. p. 401. (*excl. syn.*)

HAB. Tasmania, *Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 12–18 inches high, undivided, set throughout with subhorizontal, opposite or alternate branches. *Branches* bipinnate, the pinnæ alternate and shorter toward the apices, pinnules 1–2 lines long, truncate, slightly constricted at base, simple or warted, or bearing two or more sessile ceramidia. *Colour*, a dull purplish-red.

Allied to *L. dasyphylla* and *L. papillosa*, but a much larger and stronger plant than either, and less warted than the latter.

13. LAURENCIA affinis, *Sond.*; "fronde tereti ramosissima, ramis alternis erecto-patentibus, fastigiatis, ramulis patulis basi subattenuatis." *Sond. in Pl. Preiss.* vol. ii. p. 178.

HAB. Swan River, *Mr. Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

Four inches high, with a roundish outline. *Frond* terete, much branched from the base. *Branches* close together, irregularly dichotomous, erecto-patent, the upper ones frequently secund; ultimate *ramuli* subdivaricate, slightly narrowed to the base, obtuse, a line long. *Colour*, a brownish-red, becoming yellow in decay.

Closely related to *L. Forsteri* but with a much duller colour, denser branches and a more irregular ramification. The basal attenuation of the ramuli is very inconsiderable.

14. LAURENCIA Forsteri, *Grev.;* fronde terete filiformi ramosissima pinnato-dichotoma fastigiata, ramis minoribus subdichotomis patulis, ramulis cylindraceis patentibus. *Grev. Syn.* p. lii. *Sond. Pr. Pl.* vol. ii. p. 178. *Turn. Hist.* t. 77. &c.

HAB. Western and Southern shores of Australia and Tasmania. A common plant. (*v. s. in Herb. T. C. D.)*

Frond 2–8 inches long, varying from the diameter of hog's bristles to that of packthread or small twine, nearly equal throughout, much divided and somewhat fastigiate, the branches alternate or subdichotomous; the lesser divisions more regularly dichotomous, but varying to alternate or secund. *Colour,* a pinky-red, fading to orange.

A very variable plant in size, and partially in ramification; allied to *L. obtusa,* but more fastigiate and dichotomous.

* * * *Frons teres; ramuli clavati v. fusiformes, basi maximè attenuati.*

15. LAURENCIA dasyphylla, *Grev.;* fronde tereti filiformi decomposito-pinnata v. vage ramosa; ramis erecto-patentibus; ramulis brevibus clavatis obtusis transversim striatis basi maxime attenuatis. *Grev. Alg. Brit.* p. 112. *Harv. Phyc. Brit.* t. clii. &c.

HAB. Tasmania, *Mr Gunn.* (*v. v. et s. in Herb. T. C.D.*)

Fronds tufted, 6–12 inches high, much branched, with a pyramidal outline; the main stem undivided, closely pinnated with lateral branches. *Branches* twice or thrice pinnate, terete, slender. *Ramuli* club-shaped or top-shaped, very obtuse, much attenuated at base. *Ceramidia* ovate, sessile on the ramuli. *Colour* varying from a dark purple to a pale purplish-pink.

A widely dispersed species, common on the shores of Europe and of North America. The Tasmanian specimens are undistinguishable from those of Europe.

16. LAURENCIA tenuissima, *Grev.;* fronde terete filiformi vage ramosa; ramis (lateralibus) elongatis virgatis basi apiceque attenuatis; ramulis sparsis setaceis basi attenuatis apici acuminatissimis; ceramidiis ovatis subsessilibus sparsis. *Grev. Alg. Brit.* p. 113. *Harv. Phyc. Brit.* t. cxcviii.

HAB. Tasmania, *Mr. Gunn.* (*v. v. and s. in Herb. T. C. D.*)

Fronds densely tufted, 6–10 inches long, half a line in diameter below, much attenuated upwards. *Stem* either simple or divided into several principal portions, each of which is closely set with slender, attenuated, rod-like, simple branches, more or less densely clothed with setaceous ramuli. *Ramuli* very slender, much tapered towards either end. *Ceramidia* ovate, subsessile, plentifully scattered over the ramuli. *Colour* varying from pale purple to brown yellow.

Equally cosmopolitan with the preceding, but less variable in appearance. A peculiarly slender and graceful plant.

17. Laurencia fusifolia, *Hook.fil. et Harv.;* fronde circumscriptione conico-ovata dense ramosa robusta; ramis lateralibus crebris alternis undique insertis basi et apice attenuatis simplicibus pinnatis bi-pinnatifidisve; ramulis fusiformibus obtusiusculis. *Hook.fil. et Harv. in Lond. Journ.* vol. vi. p. 401.

Hab. Sullivan's Cove, Tasmania, *Dr. Lyall.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Dr. Lyall's specimens, of which I have seen but two, are young, and possibly, at a later period of growth would have presented a very different aspect. They are much more robust than *L. tenuissima,* and the branches and ramuli are remarkably spindle-shaped.

18. Laurencia Capensis, *Harv.;* frond terete basi et apici attenuata elata pluries pinnata; pinnis pinnulisque alternis oppositisque patentibus basi et apici attenuatis; ramulis fusiformibus acutis sæpe oppositis simplicibus v. corymboso-compositis; ceramidiis globosis breve pedicellatis. (Tab. XXXI.) *L. laxa, Harv. Gen. S. A. Pl.* p. 401. *excl Syn.*

Hab. Table Bay, Cape of Good Hope, *W. H. H.; Dr. Pappè,* &c. (*v. v. et s. et in Herb. T. C. D.*)

Fronds a foot or more in length, simple or parted into several principal stems, attenuated at base and tapering to the extremity. *Stems* 1–2 lines in diameter in the middle, bi-tri-pinnate. *Pinnæ* opposite or alternate, rather distant, patent. *Pinnules* more frequently opposite, but sometimes alternate, all tapering to the base and apex. *Ramuli* from a quarter to half an inch long, fusiform, acute, simple or having a second set of similar, crowded, subverticillate ramelli, which are either simple or compound and give a corymbose character to the compound ramulus. *Ceramidia* nearly spherical, lateral, on short pedicels rising from the sides of the fusiform ramuli.

A very distinct species, although I formerly confounded it with *L. laxa,* a plant I have never seen, but which must, judging from Turner's figure and description, be something very different.

Tab. 31. Laurencia Capensis. Fig. 1. A frond:—*of the natural size.* 2. Fusiform ramuli. 3. A fertile ramulus, with ceramidia:—*both magnified.*

Species inquirenda.

19. Laurencia? batracopus, *Grev.;* "fronde lineari dichotoma; ramis divaricatis extremitatibus divaricatis bilobis." *Bory. in Duper. Voy.* (*sub Gigartina.*) p. 153. t. 19.

Hab. Conception, Chili.

GENUS 5. CLADHYMENIA, *Harv.*

Frons plana, membranacea, rosea, tenuis, linearis, distiche pinnatifida, flaccida, e cellulis magnis polygonis granuliferis superficiem versus minutis composita. *Ceramidia* (*in Cl. Lyallii*) oblonga, ramuliformia, e ramulo inflato vix contracto formata, fasciculum sporarum foventia. *Tetrasporæ* (*in Cl. Gunni*) minutæ, sparsæ. Algæ *Australasicæ* pulcherrimæ, pluries pinnatæ. *Ramuli* obtusissimi.

1. CLADHYMENIA Gunnii, *Harv.; fronde* tenuis membranacea lato-lineari profunde bipinnatifida; pinnis pinnulisque alternis patentibus inferioribus brevibus dentiformibus superioribus elongatis; axillis rotundatis; pinnulis obtuse dentatis; apicibus obtusis. (TAB. XXXII.) *Harv. in Lond. Journ. Bot.* vol. iii. p. 443. (*sub Laurencia membranacea.*)

HAB. George Town, Tasmania, *Mr. Gunn. No.* 1277.

Frond 8–12 inches long, half an inch to an inch broad, flat, and delicately membranaceous, deeply pinnatifid or bipinnatifid, every lobe alternate and exactly distichous; the lower lobes short and tooth-like, the upper gradually longer and more compound. All the axils remarkably rounded, and the apices very blunt. *Tetraspores* minute, scattered through the pinnæ and pinnules. *Colour*, a pale, purplish rosy tint.

Tab. XXXII. CLADHYMENIA GUNNII. Fig. 1. Frond:—*of the natural size.* 2. Apices of fertile ramuli, with tetraspores. 3. Tetraspores. 4. Transverse, and 5, longitudinal sections of the frond. 6. Portion of the surface:—*all more or less magnified.*

2. CLADHYMENIA Lyallii, *Hook. fil. et Harv.;* radice fibrosa ramosa, fronde angusta nervo obsoletissimo percursa gelatinoso-membranacea bi-tripinnatifida, laciniis lineari-lanceolatis basi angustatis patentibus apicem versus brevioribus supremis simplicibus, inferioribus elongatis pinnatifidis bi-pinnatifidisque ramulis filiformibus obtusis; ceramidiis elliptico-oblongis pedicellatis. (TAB. XXXIII.) *Hook. & Harv. in Lond. Journ.* vol. iv. p. 540.

HAB. Bay of Islands, New Zealand, *Dr. Lyall.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds 4–5 inches high, in circumscription broadly deltoid, filiform at base, quickly becoming flat, and gradually acquiring the breadth of one, and, in the middle, of 2–3 lines, and thence tapering to the apex; traversed by an obsolete internal nerve; repeatedly pinnate. *Pinnæ* lanceolate, the lowest bipinnatifid, the middle pinnatifid, the upper entire or slightly toothed. *Ramuli* linear, filiform, obtuse. *Colour*, a fine rosy red.

TAB. XXXIII. CLADHYMENIA Lyallii. Fig. 1. Frond:—*of the natural size.* 2. Ceramidium and ramulus. 3. Spores. 4. Transverse section, showing a section of the internal nerve:—*all magnified.*

3. CLADHYMENIA oblongifolia, *Hook. fil. et Harv.;* radice fibrosa ramosa, fronde latiuscula enervi gelatinoso-membranacea pinnatifida et bipinnatifida; laciniis erecto-patentibus oblongis basi attenuatis subpetiolatis apice obtusissimis subtruncatis; ramulis ultimis pusillis ciliiformibus linearibus obtusis alternis brevibus; ceramidiis oblongis pedicellatis. *Hook. & Harv. in Lond. Journ.* vol. iv. p. 540.

HAB. Paroah Bay, New Zealand, *Dr. Lyall.* (*v. s. in Herb. Hooker.*)

A single specimen only has been seen. The *frond* is four inches long, half an inch broad in the middle, gradually tapering to the base, and very blunt at the apex. *Colour,* a rosy pink.

GENUS 6. ASPARAGOPSIS, *Mont.*

(*Lictoria,* J. Ag.)

Frons filiformis, compresso-teres, solida, continua, cellulosa, nervo tenuissimo articulato monosiphonio percursa, penicillato-ramosa; *rami* pinnatim compositi, ramulis tenuissimis setaceis laxe cellulosis pectinati. *Ceramidia* longe pedicellata, ovato-sphærica, massam globosam densam *sporarum* foventia. *Tetrasporæ* (mihi ignotæ) "in ramulorum apicibus clavatis granulosis."—Alga *cosmopolitana,* penicillato-plumosa, delicatissima, roseo-purpurea. *Frondes* e surculis repentibus ortæ, indivisæ, circumscriptione lanceolatæ, ramis lateralibus crebris brevibus pinnatæ, ramulisque oppositis minutis setaceis ciliatæ. *Ceramidia* versus basin ramorum sita.

1. ASPARAGOPSIS Delilii, *Mont. Fl. Canar. Pl. Cel.* p. xv. (TAB. XXXV.)

DASYA Delilii, *Mont. l. c.* p. 166. t. 8. f. 6.

LICTORIA taxiformis, *J. Ag. in Linn. XV.* p. 22.

HAB. Tasmania, *Mr. Gunn. (v. s. in Herb. T. C. D. comm. cl. Hooker.; cl. Montagne, &c.)*

Fronds rising from prostrate surculi, erect, 6–10 inches long, compresso-cylindrical, undivided, but clothed throughout their whole length with short, closely set, distichous branches from half an inch to two inches in length; the whole frond having a linear-lanceolate outline. *Branches* either simple, or once or twice pinnate, pectinated with exceedingly slender, subulate, distichous, opposite ramuli. *Ceramidia* ovato-globose (formed by the metamorphosis of the apex of a branch) on long peduncles, which spring either from the main stem or from one of the primary branches; generally from the lower part of the stem or branch. They contain a very large, dense tuft of pear-shaped spores.

A native, also, of the Mediterranean, and the Canary Islands.

Tab. XXXV. ASPARAGOPSIS DELILII. Fig. 1. A frond:—*the natural size.* 2. A pinnate branch. 3. One of the setaceous ramuli. 4. Ceramidium on its pedicel. 5. Tuft of spores. 6. Spores. 7. Transverse section of the frond. 8. Longitudinal section:—*all more or less highly magnified.*

GENUS 7. DELISIA, *Lamour.*

(*Calocladia,** Grev.; J. Ag. *Bowiesia,* Grev. Syn.)

Frons filiformis, compresso-teres v. anceps, solida, continua, cellulosa, nervo tenui composito percursa, pinnatim ramosissima; *rami* ramulis subulatis pectinati. *Ceramidia* apicem versus ramorum sessilia, ovata, fasciculum *sporarum* pyriformium foventia. Algæ *australes*, concinnæ, decomposite ramosæ, pectinato-ciliatæ, roseæ.

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* *Calocladia Suhrii,* Endl. 3rd Suppl. p. 44., is certainly *Ptilota flaccida.*

1. **Delisia** elegans, *Ag.;* fronde tereti-compressa membranacea angusta ramosissima; ramis alternis pinnatim-decompositis; ramulis setaceo-subulatis applanatis distichis alternis; ceramidiis infra apicem ramorum sessilibus solitariis binisve foramine laterali. (Tab. XXXIV.) *Harv. in Lond. Journ.* vol. iii. p. 412. (*Bonnemaisonia*,) &c.

Hab. George Town, Tasmania, *Mr. Gunn.* West Coast of New Holland, *Agardh.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 6–12 inches long, excessively and finely branched; the stem and branches compressed, the ultimate divisions flattened. All the branches and their divisions are bordered with distichous, awl-shaped, very acute cilia or ramuli. *Ceramidia* ovate, always near the tips of the branches, solitary or binate, seated in the sinus of the marginal cilia, opening by a pore directed outwards and containing a tuft of pear-shaped spores.

A highly beautiful plant closely resembling the northern *Bonnemaisonia asparagoides* in habit and ramification, but readily distinguished by the difference in fructification.

Tab. 34. **Delisia elegans.** Fig. 1. A branch:—*the natural size.* 2. Apex of a fertile branch, with ceramidia. 3. Ceramidium and ramuli. 4. Spores. 5. Transverse section of the frond:—*all magnified.*

2. **Delisia** pulchra, *Grev.;* fronde compressa ancipite cartilaginea elata pinnatim decomposita; ramis longissimis simplicibus bipinnatis; pinnis alternis pinnulisque erecto-patulis; apicibus latiusculis; ramulis subulatis distichis alternis; ceramidiis apicalibus solitariis foramine verticali. (Tab. XXXIV.) *Hook. fil. et Harv. Fl. Antarct.* vol. ii. p. 484. etc.

Hab. New Holland, *Frazer.* Tasmania, *Herb. Paris.* Kerguelen's Land, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker; cl. Decaisne.*)

Frond 1–2 feet long, a line or more in breadth, cartilaginous, much branched in a pinnate manner, all the divisions alternate and erecto-patent. Principal *branches* long and simple, obovate in outline, pinnate below; bipinnate above, the lower pinnæ short and simple, the upper elongate and pinnulate. The lesser branches are much compressed and the apices are expanded and frequently flattened into a leaf-like body. The whole frond is bordered with subulate ramuli. *Ceramidia* terminating the ramuli, ovate, sessile: their place sometimes supplied by a swelling of the frond, in which I have not succeeded in detecting any peculiar structure, but it is very probable that *tetraspores* are sometimes found there.

Tab. 34. **Delisia pulchra.** Fig. 1. A small branch:—*the natural size.* 2. Pectinated branchlet. 3. Upper branchlets with the apices swollen and cellular. 4. Branchlets with *ceramidia.* 5. An apex with its ceramidium. 6. Section of a ceramidium. 7. Spores. 8. Transverse section of the frond:—*all magnified.*

* * *

Genus dubiæ affinitatis.

GENUS 8. ? THYSANOCLADIA, *Endl.*

(*Lenormandia, Mont., nec Sond.*)

Frons cartilaginea, plana vel tereti-compressa, linearis, pinnatim ramosa, disticha, e stratis tribus cellularum conflata: *stratum medullare* e filis longitudinalibus densissime compactis, *intermedium* e cellulis magnis polygonis vacuis, *corticale* e cellulis minimis seriatis contextum. *Ceramidia* (?) (in *T. dorsifera*) infra apicem ramorum dorsalia, aggregata, pericarpio crasso fibroso, massam sporarum perpusillarum foventia. Algæ *australes*, fusco-purpureæ, siccitate nigricantes, pluries pinnatæ; pinnæ inciso-dentatæ v. pectinato-laciniatæ. *Genus* potius ad *Cryptonemeas*, prope *Gelidium*, transferendum.

1. THYSANOCLADIA dorsifera, *Endl.*; "fronde crebre tripinnatifida inferne costata, pinnulis inciso-serratis medio capsuliferis." *Ag. Sp. Alg.* vol. i. p. 372. (*Rhodomela.*) (TAB. XXXV.)

HAB. New Holland, *Mus. Paris.* (*v. s. frustulum in Herb. T. C. D. comm. cl. Decaisne.*)

"*Frond* 6–8 inches long, closely tripinnatifid, the divisions of the frond linear; the primary two lines broad, obsoletely ribbed; the upper ones gradually narrower and shorter, nearly ribless; the pinnules serrato-incised. *Ceramidia* sessile on the surface of the ultimate pinnules, hemispherical, containing very minute, aggregate, globose, or slightly angular spores, hyaline save the darker margin. *Substance* submembranaceous. *Colour*, blackish-purple," (brown when dry). *Ag. l. c.*

Having only seen a fragment of this plant, I think it best to copy Agardh's description.

Tab. 35. THYSANOCLADIA DORSIFERA. Fig. 1. Apex of a smaller branch with pinnules:—*the natural size.* 2. The same magnified. 2. Apex of pinnule, with cluster of *ceramidia* (or coccidia?) 4. Vertical section of ceramidia. 5. Spores. 6. Transverse section of frond. 7. Longitudinal section of the same. 8. Longitudinal fibres, from rib:—*all magnified.*

2. THYSANOCLADIA? coriacea, *Harv.*; caule primario plano nervo latissimo incrassato, ramis enerviis v. medio incrassatis bi-tri-pinnatifidis; pinnis pinnulisque oppositis pinnulis planis simplicibus dentatisve; fructu ignoto. (TAB. XXXVI.)

SPHÆROCOCCUS coriaceus, *Sond. Pl. Preiss.* vol. ii. p. 192.

HAB. Swan River, *Mr. Backhouse*; *Herr Preiss*; *Mr. Mylne.* (*v. s. in Herb. T. C. D. comm. cl. Backhouse*; *cl. Binder.*)

Root, a large, fleshy mass. *Fronds* six inches long and as much in expansion, divided into several segments or stems, which are usually naked below and closely pinnatifid with erecto-patent branches or laciniæ in their upper half: *stems*, quarter to half an inch broad, coriaceo-membranaceous, flat, but thickened with a very broad and dense mid-rib which in the lower part frequently covers the whole breadth of the stem, to the obliteration of the lamina. *Branches* gradually shorter upwards, linear, flat, thickened below, with a

vanishing mid-rib, nerveless above, bi-tri-pinnate, the pinnæ and pinnules opposite or nearly so, quite flat, linear, obtuse, or subacute; the ultimate ramuli a quarter of an inch long, simple or toothed. *Substance* very tough and leathery. *Colour,* when dry, a dark reddish-brown, without lustre.

Notwithstanding some difference in the structure of the internal rib (not sufficiently noticed in the figures), I cannot help thinking that this plant, whose fruit is unknown, will prove to be a congener of the *Rhodomela dorsifera,* Ag., with which it strictly agrees in the majority of its characters. I formerly (in the Herbarium) associated it with *Gelidium,* and my friend *M. Montagne* is still disposed to make it a species of that genus. No doubt it is nearly allied in structure to *Gelidium;* and so is *Sphærococcus* (though made the *type* of another family); and eventually the three genera will be brought near together. Still I think the present plants associates better with the preceding and following than with *Gelidium.*

Tab. 36. THYSANOCLADIA? CORIACEA. Fig. 1. Frond:—*the natural size.* 2. Part of branch. 3. Longitudinal; and 4, transverse slice, to show the structure of the frond:—*magnified.*

3. THYSANOCLADIA pectinata, *Grev. & Harv.;* caule primario compresso ancipiti coriaceo-cartilagineo nec alato supra ramulis (setis-ve) creberrimis subulatis partitisque densissime onusto, ramis gracilibus confertis pectinatis bipectinatisque, laciniis oppositis filiformibus acutis simplicibus v. apice ramulosis; fructu ignoto.

HAB. Swan River, *Mr. Mylne,* (No. 12, 67, 92.) (*v. s. in Herb. Lemann; et in Herb. T. C. D. comm. cl. Lemann.*)

Root, a large, fleshy mass. *Fronds* a foot long, simple or divided near the base into several principal stems. *Stems* plano-compressed, two-edged but not winged, quarter of an inch in diameter, naked below, densely clothed all over in their upper half with short, filiform, subulate or multifid ramuli, and pinnated with closely set, distichous branches. *Pinnæ* a line asunder, patent, the lowest one, two or three inches long, and half a line in diameter; the upper gradually shorter, so that the outline of the pinnate portion is ovate, pectinate or bitripectinate. Ultimate *ramuli* opposite, filiform, terete, half an inch to an inch long, acute, sometimes multifid at the apex. *Substance* very tough. *Colour,* when dry, a dark red-brown, without lustre.

A very beautiful and distinct plant, and in my opinion of the same genus as the preceding. But the fructification of both is unknown.

FAM. 3. CORALLINEÆ, *Lamour.*

CORALLINEÆ, *Lamour. Cor. Flex.* p. 244. *Dne. Class.* p. 85. *Endl.* 3rd. *Suppl.* p. 48. *Lindl. Veg. King.* p. 25. CORALLINEÆ and SPONGITEÆ, *Kütz. Phyc. gen.* p. 385–387. CORALLINIDÆ and NULLIPORIDÆ, *Johnst. Brit. Lith.* p. 205.

Frons rigida, sæpissime calcarea, articulata v. crustacea, intus e cellulis elongatis cylindraceis in fila connexis densissime compactis composita; cellulæ exteriores sensim minores, superficiales minutissimæ. *Conceptacula* externa, (*ceramidia* dicta,) ovata vel urceolata, intra pericarpium celluloso-calcareum apice pertusum fasciculum sporarum pyriformium ad placentam centralem basilarem affixarum foventia; *sporæ* (an *tetrasporæ* ?) zonatim quadripartitæ.

The plants of this family are readily known from all other *Rhodosperms* by their stony substance; the cells of which the frond is composed possessing the remarkable property of withdrawing carbonate of lime from the waters of the sea and laying it up as a strengthening to their walls. Thus the frond appears as if coated with a hard enamel, and when broken seems to be equally stony within. It is only when it is macerated in acid (hydrochloric is the best solvent) that, the lime being dissolved, the truly vegetable structure of the frond becomes apparent. We then find, in place of the stony branches, a soft and flexible body of the same form and scarcely inferior size, composed of densely packed cellular tissue. The cells which form the central substance or medullary portion (*axis*) are long and cylindrical, arranged in vertical, jointed filaments, whose joints coincide, so that the bundle of filaments composing the frond appears as if transversely banded at regular intervals. The cells near the surface curve outwards and are shorter than the inner ones, and those which form the actual outer coat are of very small size. Considerable uniformity of cellular structure prevails throughout the family. The external characters of these vegetables are two-fold, so that they naturally divide into two subfamilies. In the first, or *jointed-Corallines,* the frond consists of slender branches, dichotomous or pinnate, composed of a series of articulations placed one on the other, separated by flexible cartilaginous joints. It is curious that the cells of the joints are free from calcareous matter,—a structure evidently designed to give flexibility to the frond. In most species the non-calcareous portion of the frond is very short, sometimes a mere transverse line; but in others, as in *Amphiroa stelligera,* it very frequently exceeds in length the calcareous portion. In the second subfamily, or the *Nullipores,* the frond is either a flat incrustation covering the surface of rocks or of algæ, or it rises into stony branches, or expands into leafy lobes, assuming many of the forms characteristic of *Lichens.* In the most perfect genus of this subfamily (*Mastophora*) there is often a subcartilaginous flexible stem which supports the calcareous leaf; such forms showing a transition into the common fucoid type.

The fructification of all the genera and of most of the species has been observed, and exhibits considerable uniformity in general structure, combined with some startling violations of uniformity in particulars. Thus in all, the conceptacle contains a tuft of spores divided, by transverse lines, into four, sometimes into three parts. Are these to be called *spores* or *tetraspores?* In their *position*, being contained in regular conceptacles of the form called *ceramidia*, they are *spores;* but they have the structure of the dispersed tetraspores of many genera, such as *Plocamium*, *Furcellaria*, *Hypnea*, &c. What I call violations of uniformity in fructification occur in more than one species of *Corallina*, especially in the common *C. officinalis*. The normal fruit of this species consists of a ceramidium formed by the metamorphosis of the last articulation of a ramulus. But occasionally the lower articulations of the ramuli, and even of the branches of the whole frond, become thickly warted with abnormal ceramidia, of smaller size, but equally fertile with the terminal ones. These have quite the aspect and structure of the *normal* ceramidia of *Amphiroa!* A similar anomaly occurs in *C. squamata*, where, besides the spurious wart-like ceramidia, there are tentaculate conceptacles, like those of *Jania*. When we find species on our own coasts (I mean those of Britain) so inconstant in the character of their fructification, we should be very careful how we decide on the validity of species, only known to us by the solitary specimens brought home by voyagers and preserved in herbaria. No tribe of Algæ has been more neglected than the *Corallineæ*, or requires a more patient and attentive study from persons having access to the living plants; and very few exceed this family in the beauty and grace of its members. A rich harvest of novelty awaits the explorer in tropical and subtropical waters.

In their position on the coast, the Corallineæ occupy a middle place between the non-calcareous algæ and the zoophytes. A few vegetate near high-water mark, but seldom vigorously. As you approach the verge of low water they abound, developing well coloured and well grown fronds. Beyond the line of the tide, and extending to the region occupied by zoophytes, occur the majority of the subfamily of *Nullipores*. These often form vast banks, the lower strata of which consist of dead fronds, the surface plants only being in vigour. Such plants are rarely attached to the ground or to one another, but lie together in heaps. In such situations we seldom find perfect fructification. In the Nullipores which grow between tidemarks, on the contrary, fruit is frequently formed.

The chief circumstance noticeable in the geographical distribution of forms in this family is, that the genus *Amphiroa* is chiefly from the Southern Ocean. So is the section of Jania called *Haliptilon;* while *Mastophora* occurs in the tropical sea, and in subtropical latitudes of the Southern Ocean. *Corallina* extends to a high latitude in both hemispheres, but the species are most numerous in the northern one.

Until recently this family was confounded with polypiferous zoophytes, with which division of the animal kingdom they had been united by Ellis. Now, by the labours of several distinguished modern observers, their vegetable nature has been so clearly established that it is no longer necessary to insist upon it, or bring forward further proofs.

The Southern genera are as follows: —

CONSPECTUS GENERUM CORALLINEARUM.

Sub-fam. 1. Corallineæ veræ :—*Frons filiformis, ramosa, articulata.*

I.—Amphiroa. *Ceramidia* conica, e disco articuli enata.

II.—Corallina. *Ceramidia* urceolata, terminalia, lævia.

III.—Jania. *Ceramidia* turbinata v. urceolata, axillaria vel terminalia, cornibus binis instructa.

Sub-fam. 2. Nulliporeæ :—*Frons crustacea v. foliacea, inarticulata.*

IV.—Mastophora. *Frons* flexilis, sæpius flabelliformis, stipitata.

V.—Melobesia. *Frons* calcarea, rigida, incrustans v. ramosa, ramis lapidescentibus.

GENUS 1. AMPHIROA, *Lamour.*

Frons articulata, calcarea, geniculis cartilagineis sæpissime nudis. *Ceramidia* conica, verrucæformia, in medio articuli sita, apice poro pertusa, fasciculum sporarum pyriformium foventia. *Sporæ* demum zonatim quadripartitæ. Algæ sæpissime *australes*, habitu vario, pinnatæ v. dichotomæ v. raro ramis ramulisque verticillatis. *Articuli* nunc lineari-teretes, nunc compressi v. ancipites, oblongi, obcordati, obconici v.elliptici.

* EUAMPHIROA, *Dne.* Articuli *lineares, elongati, teretes v. parum compressi.* Ceramidia *sparsa, numerosa.*

1. AMPHIROA ephedræa, *Dne.;* fronde elata filiformi di-tri-chotoma ramosissima, ramis pluries furcatis sensim attenuatis obtusis, axillis acutis, geniculis nudis longiusculis cartilagineis nigro-fuscis, articulis omnibus cylindraceis, basilaribus brevissimis, mediis terminalibusque diametro 4–5-plo longioribus, ceramidiis minutis numerosissimis. (TAB. XXXIX.) *Dne. Class.* p. 112, &c.

HAB. Shores of Australia. Algoa Bay, C.B.S., *Herb. Bowerbank (v. s. in Herb. T. C. D. comm. cl. Bowerbank.)*

Frond 10-12 inches long or more, much branched; the lower divisions often trichotomous, the upper divisions and branches dichotomous. All the axils acute, and the branches tapering to the extremity. *Articulations* in all parts of the frond cylindrical, or the upper ones very slightly compressed, smooth when barren, densely warted all over when in fruit; separated by a naked, cartilaginous, dark-coloured joint. *Colour,* a dull lurid purple, turning to green.

TAB. 39. AMPHIROA EPHEDRÆA. 1. Part of Frond;—*of the natural size.* 2. Fertile ramuli. 3. Vertical section of ceramidium. 4. Spores;—*all magnified.*

2. AMPHIROA Gueinzii, *Harv.;* fronde elata compressa di-tri-chotoma fastigiata flabelliformi ramosissima, ramis pluries furcatis basi et apici attenuatis medio latiusculis, axillis acutis, geniculis nudis longiusculis cartilagineis nigro-fuscis, articulis basilaribus brevibus cylindraceis, mediis linearibus ancipitibus angustis diametro 3–4-plo longioribus, terminalibus tereti-compressis cylindricisve diametro 4–5-plo longioribus, ceramidiis minutis numerosissimis.

HAB. Port Natal, *Dr. Gueinzius (v. s. in Herb. T. C. D.)*

Nearly related to *A. ephedræa* but more flabelliform, and having strongly compressed, though narrow, articulations.

3. AMPHIROA exilis, *Harv.;* fronde pusilla tereti-compressa dichotoma, ramis pluries furcatis linearibus nec attenuatis obtusis, axillis acutis, geniculis brevissimis, articulis basilaribus subcylindricis longiusculis, mediis linearibus compressis plus minus ancipitibus angustis diametro 4–5-plo longioribus, terminalibus tereti-compressis linearibus apice latioribus obtusissimis, ceramidiis minutis numerosissimis. Var. *β. crassiuscula;* ramis crassiusculis parum compressis patentibus minus ramosis, articulis subbrevioribus.

HAB. Rio, *Mr. Darwin,* 595, 629. Algoa Bay, *Herb. Bowerbank.* *β,* Cape of Good Hope, *Mr. Darwin,* No. 3686. *(v. s. in Herb. T. C. D. comm. cl. Darwin.)*

Frond 1–2 inches high, slender, dichotomous, the branches several times forked, nearly of equal breadth throughout, more or less strongly compressed. Cartilaginous *joints* very short, indicated by a narrow line. When in fruit the fertile articulations are frosted over with minute ceramidia. *Colour*, a dark purple or greenish. β. is less branched, more robust and less compressed than the normal form, but otherwise very similar.

4. **Amphiroa** charoides, *Lamour.;* fronde tereti (siccitate fragillima) elata verticillata vel trichotoma, ramis simplicibus furcatisque, ramulis ad genicula ramorum verticillatis, geniculis elongatis cartilagineis nudis, articulis omnibus cylindraceis, basilaribus crassis brevibus, mediis terminalibusque gracilibus longissimis strictis v. curvatis, ceramidiis numerosis subsecundis. (Tab. XXXIX.) *Dne. Class.* p. 112, &c.

Hab. Shores of Australia and Tasmania. Common. (*v. s. in Herb. T. C. D.*)

Frond 3–4 inches long, forming globose, fastigiate tufts, much branched in an irregularly trichotomous or verticillate manner. *Branches* not much divided, beset at every joint with numerous whorled ramuli, each of which consists of a single articulation, from half an inch to an inch in length. *Articulations* variable in different specimens, quarter to half a line in breadth, half to one inch long, very solid and compact. *Joints* long, naked, supporting the ramuli as if on petioles. Very fragile, and usually faded in colour to an ivory-white.

Tab. 39. Amphiroa charoides. Fig. 1. Portion of frond:—*the natural size.* 2. Some barren ramuli. 3. A fertile ramulus:—*both slightly magnified.*

5. **Amphiroa** stelligera, *Lamour.;* fronde tereti elata verticillata et trichotoma, ramis elongatis umbellato-ramosis, ramulis ad genicula ramorum verticillatis tenuissimis e quoque fere geniculo orientibus, geniculis elongatis nunc longissimis nunc breviusculis nudis cartilagineis, articulis omnibus teretibus, ramorum basi et apici incrassatis, ramulorum gracillimis filiformibus, ceramidiis subbinis majusculis. *Dne. Class.* p. 112, &c.

Amphiroa elegans, *Sond. in Pl. Preiss.* vol. ii. p. 187.

Hab. Australia and Tasmania. Common. King George's Sound, *Darwin*, No. 3558. (*v. s. in Herb. T. C. D.*)

Frond 4–6 inches high or more, verticillately and umbellately branched, much divided and slender; the branches about half a line in diameter, the ramuli setaceous or capillary. The cartilaginous, naked joints are generally of great length; frequently only a third part of the internode is coated with lime, the basal and apical thirds being of cartilaginous substance. *Colour*, faded to ivory-white.

6. **Amphiroa** jubata, *Lamour.;* ramis verticillatis; articulis ramorum maximis, verticillorum minimis, inæqualibus, capillaceis. *Lamour. Pol. Flex.* p. 301. t. 11. f. 6.

Hab. Australia, *Lamouroux.*

7. **Amphiroa** interrupta, *Lamour.;* ramis verticillatis; articulis longissime et inæqualiter distantibus. *Lamour. Pol. Flex.* p. 300. t. 11. f. 5.

Hab. Australia, *Lamouroux.*

8. **Amphiroa** verrucosa, *Lamour.;* trichotoma, vel paululum verticillata; articulis tere-

tibus, verrucosis, extremitatibus inflatis. *Lamouroux, Hist. des Pol. cor. flex.* p. 230. tab. 11. fig. 4.

HAB. Australia, *Lamouroux.*

9. AMPHIROA cyathifera, *Lamour.;* "trichotoma seu verticillata, rigida, fragilis; articulis longis teretibus, in apice cyathiferis." *Lamour. in Frey. Voy. Zool.* p. 627.

HAB. "Iles Moluques," *Freycinet.*

10. AMPHIROA crassa, *Lamour.;* "articulata, dichotoma, articulis crassissimis inæqualibus, superficie verrucosa." *Lamour. in Frey. Voy. Zool.* p. 627.

HAB. Coast of New Holland, *Freycinet.*

* * EURYTION, *Dne.: articuli oblongi, applanati v. ancipites. Ceramidia sparsa, numerosa.*

11. AMPHIROA Bowerbankii, *Harv.;* fronde robusta, tri-dichotoma ramosissima compresso-plana, ramis pluries furcatis sursum sensim latioribus, geniculis granulis calcareis onustis, articulis basilaribus subteretibus, mediis lato-cuneatis applanatis, superioribus elliptico-oblongis v. cuneatis applanatis truncatis terminalibus rotundatis, ceramidiis minutis verrucosis numerosissimis. (TAB. XXXVII.)

HAB. Cape of Good Hope; Algoa Bay, *Herb. Bowerbank.* Port Natal, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D. comm. cl. Bowerbank; Gueinzius.*)

Frond 3–4 inches high, the primary branches trichotomous, all the rest dichotomous. *Branches* many times forked, becoming broader and flatter upwards. Basal articulations compressed, but thick, linear oblong; those of the lower part of the branches two-edged, dilated, broadly wedge-shaped; of the upper elliptic-oblong or irregular, much flattened and sharp-edged, truncate at the top. *Joints,* except in the youngest part of the frond, where they are naked, densely covered with small, hard, calcareous granules. *Ceramidia* very small and numerous, like pimples, covering the fertile articulations. *Colour,* a purple-red.

A very noble species which I dedicate to J. Scott Bowerbank, Esq., who most generously placed the whole of his collection of corallines at my disposal, for examination.

Tab. 37. AMPHIROA BOWERBANKII. Fig. 1. Frond:—*the natural size.* 2. Part of a branch. 3. Fragment (with the lime removed) with ceramidium. 4. Vertical section of a ceramidium. 5. A spore. 6. Cellular tissue of the frond:—*magnified.*

12. AMPHIROA dilatata, *Lamour.;* fronde tri-dichotoma, ramis pluries furcatis sursum sensim dilatatis, geniculis nudis brevissimis, articulis inferioribus angustis subteretibus vel compressis, superioribus sensim latioribus lineari-cuneatis compresso-planis ancipitibus diametro 3–4-plo longioribus apice emarginatis v. denticulatis, ceramidiis numerosissimis minutis. *Dne. Class.* p. 113. *Lamour. Cor. flex.* p. 298.

HAB. Port Natal, *Dr. Gueinzius.*

Fronds (much broken) seemingly 2–3 inches high, the primary branches often trichotomous, the rest dichotomous, much branched. *Stems* rather slender below, compressed or subterete, gradually becoming flatter and wider upwards. *Joints* very short, fitted into an excavation of the articulation. *Middle* and *upper* articulations plano-compressed, two-edged, linear or linear wedge-shaped, 1–2 lines broad, and about 3–4 long, the terminal ones nearly or quite as wide as the others, rounded at the top. *Ceramidia* very abundant, covering the fertile articulations. *Colour*, a bright purple-red.

13. Amphiroa anceps, *Dne.;* fronde robusta tri-dichotoma ramosissima, ramis pluries furcatis erectis sensim attenuatis, geniculis nudis longiusculis, articulis basilaribus crassis brevissimis teretibus, caulinis elongatis plus minus compressis, rameis dilatatis lato-linearibus oblongis vel ellipticis ancipitibus margine acutis basi et apici obtusis vel emarginatis, superioribus terminalibusque sensim angustioribus lineari-clavatis linearibusque truncatis, ceramidiis (mihi ignotis). (Tab. XXXVII.)

Hab. Norfolk Island, *Dr. M^{c} William.* (*v. s. in Herb. T. C. D. comm. cl. Forbes.*)

Root, a large calcareous mass. *Fronds* 3–4 inches high, excessively branched, the main divisions trichotomous, the lesser ones dichotomous; the lower part of the stem nearly cylindrical, and very robust, with short joints. Above, the stem is more compressed, with longer joints, some of which are rounded at the edge, others sharp and dilated. *Articulations* of the branches nearly flat, 1–2 lines broad, 4–5 lines long, obtuse, or rounded at both ends. Upper articulations much narrower. *Colour*, a bright reddish-purple, fading to greenish yellow.

Tab. 37. Amphiroa anceps. Fig. 1. A frond:—*the natural size.* 2 and 3. Portions of the upper and lower branches. 4. Cellular tissue:—*magnified.*

14. Amphiroa foliosa, *Lamour.;* "dichotoma, rigida, articulis inferne teretibus superne planis subfoliiformibus marginibus undulatis nervo medium percurrente." *Lamour. in Frey. Voy. Zool.* p. 628.

Hab. "Iles Mariannes," *Freycinet.*

15. Amphiroa galaxauroides, *Sond.;* "dichotoma, basi subcylindracea, ramis fastigiatis, articulis compressis linearibus basi angustatis apice auriculatis, ceramidiis creberrimis verrucæformibus poro pertusis." *Sond. in Pl. Preiss,* vol. ii. p. 188.

Hab. New Holland. Swan River, *M. Preiss.*

16. Amphiroa australis, *Sond.;* "dichotoma vel geniculis prolificantibus trichotoma, articulis compressis ovalibus oblongisve lævissimis." *Sond. in Pl. Preiss.* vol. ii. p. 188.

Hab. Swan River, *M. Preiss.*

17. Amphiroa variabilis, *Harv.;* fronde pusilla compressa trichotoma vel palmatim ramosa parum divisa, ramis simplicibus furcatis vel apice sæpe palmatis, articulis basilaribus lineari-cuneatis, inferioribus anguste cuneatis apice dilatatis biauritisque, mediis similibus longioribus, superioribus plano-compressis lato-cuneatis palmatisque, terminalibus (polymorphis) linearibus v. cuneatis latis v. angustis ceramidiis ignotis.

Hab. Cape Frio, *Mr. Darwin, No.* 437. (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

A small but curious species, excessively variable in the shape of its joints, and uniting the groups *Arthrocardia* and *Eurytion,* some of the articulations being long, flat, and unequal sided, others eared or sagittate at the top, but much drawn out below. *Colour,* in the specimens seen, faded to greenish-white.

* * * **Arthrocardia,** *Dne. Articuli compressi, plerumque subalati, obcordati. Ceramidia conica, sparsa.*

18. **Amphiroa** corymbosa, *Dne.;* fronde robusta apice bipinnata, pinnis pinnulisque creberrimis erecto-patentibus, articulis basilaribus teretibus brevissimis moniliformibus, mediis superioribusque compressis late deltoideis obcordatisve angulis lateralibus porrectis acutis vel cornigeris, articulis ramulorum subsagittatis, ultimis lanceolatis compressis. (Tab. XXXVIII.) *Dne. Class.* p. 112.

Corallina magnifica, *Leach.*

Hab. Cape of Good Hope, Algoa Bay, *Herb. Bowerbank.* New Zealand, *Rev. W. Colenso, No.* 651. (*v. s. in Herb. T. C. D. comm. cl. Bowerbank; cl. Hooker.*)

Four to five inches high, densely tufted; the stems cylindrical and naked below, closely pinnate or bipinnate, and much compressed above. *Articulations* of the upper part of the stem, and of the pinnæ strongly compressed at the sides, broadly cuneate or deltoid, with very prominent and acute lateral angles. Articulations of the ramuli mostly sagittate; the terminal ones lanceolate.

Tab. 38. Amphiroa corymbosa. Fig. 1. Frond:—*the natural size.* 2. Small portion of the same. 3. A fertile articulation, and ceramidium:—*both magnified.*

19. **Amphiroa** Wardii, *Harv.;* fronde robusta pluries pinnata circumscriptione latissima, pinnis pinnulisque creberrimis erecto-patentibus sursum sensim brevioribus, articulis diametro vix longioribus, basilaribus incrassatis compresso-teretibus subquadratis, mediis compressis cuneato-deltoideis hexagonis angulis obtusis (nec porrectis), superioribus quadratis, articulis ramulorum cuneatis oblongisve compressis, ultimis ellipsoideis obtusissimis. (Tab. XXXVIII.)

Hab. South Australia, at Port Philip, *Mrs. Mallard.* (*v. s. in Herb. T. C. D. comm. cl. N. B. Ward.*)

A fine species with the habit of the preceding, from which it is readily known by the obtuse-angled articulations.

Tab. 38. Amphiroa Wardii. Fig. 1. A frond:—*the natural size.* 2. Portion of the same:—*magnified.*

20. **Amphiroa** Mallardiæ, *Harv.;* fronde robusta pluries pinnata circumscriptione latissima, pinnis pinnulisque creberrimis erecto-patentibus sursum brevioribus, pinnulis ultimis gracilibus attenuatis teretibus, articulis diametro subduplo longioribus, basilaribus incrassatis, mediis compressis cuneato-deltoideis hexagonis angulis obtusis vel

vix acutis, superioribus cuneatis, articulis ramulorum cylindraceis filiformibus apicibus acutis.

Hab. South Australia, at Port Phillip, *Mrs. Mallard.* (*v. s. in Herb. T. C. D. comm. cl. N. B. Ward.*)

Nearly allied to *A. Wardii,* and perhaps rather a variety than a distinct species. It differs chiefly in the uniformly slender and cylindrical pinnules, tapering to a sharp point. Their terminal articulation is frequently incrassated, as if disposed to form a ceramidium.

21. Amphiroa Darwini, *Harv.;* fronde brevi plano-compressa pinnata v. bipinnata, pinnis pinnulisque creberrimis, articulis plano-compressis, basilaribus cuneatis, mediis superioribusque obcordatis et sagittatis angulis lateralibus productis obtusis, articulis apicalibus ovatis, ceramidiis binis e disco articuli prominentibus verrucæformibus.

Hab. Chonos, Chiloe, *Mr. Darwin,* No. 2423 in part. (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

Half an inch to an inch high, but probably not grown to its full size, once or twice pinnate; the pinnæ close together. *Articulations* rather shorter than broad, obcordate, or somewhat sagittate, with a deep sinus at the apex and a pair of wide, spreading, blunt, ear-like lobes; the terminal articulation ovate. All the articulations much compressed toward the edges. *Ceramidia,* one or two on each of the middle and lower articulations, rather large and prominent. *Colour,* a dark lurid purple.

Allied in many respects to *A. Orbigniana,* but with a ramification so different, that I cannot unite it with that species.

22. Amphiroa Orbigniana, *Dne.;* fronde laxe dichotoma, ramis elongatis patentibus, articulis obcordatis v. scutiformibus angulis lateralibus rotundatis auriculæformibus nunc porrectis nunc obsoletis, articulis superioribus obovatis, ceramidiis binis ternisve e disco articuli prominentibus verrucæformibus. (Tab. XXXVIII.) *Dne. Class.* p. 112. &c.

Hab. Shores of Patagonia and Chiloe, *D'Orbigny; Mr. Darwin* (1770, and part of 2423.) (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

Frond 3–4 inches long, dichotomous or irregularly trichotomous, the branches patent, distantly forked. *Articulations* obcordate or shield-shaped, the upper angles rounded and often much produced; sometimes obsolete. *Ceramidia* rather large, prominent. *Colour,* a very dark lurid purple.

Tab. 38. Amphiroa Orbigniana. Fig. 1. Frond:—*the natural size.* 2, 3, 4. Portions of the frond. 5. Section of a ceramidium. 6. A spore:—*all magnified.*

23. Amphiroa Chilœnsis, *Dne.;* "dichotoma, articulis irregularibus obcordatis v. obcordato-cuneatis dilatatis conceptaculis binis instructis, lobis plus minusve prominulis." *Dne. Class.* p. 113.

Hab. Chiloe, *M. Gay.*

* * * * CHEILOSPORUM, Dne. *Articuli compressi obcordati v. sagittati. Ceramidia bina, in margine superiore loborum immersa.*

24. AMPHIROA Stangeri, *Harv.;* fronde robusta stipitata flabellatim ramosissima, ramis dichotomis fastigiatis, apicibus latis, articulis basilaribus annulatis teretibus superne sensim cuneatis compressisque auritis vel exauritis, articulis ramorum subalterne minoribus et majoribus, minoribus apice sagittatis vel truncatis, majoribus acutiformibus vel novilunaribus apice concavis rotundatis cornibus inflexis, ceramidiis ignotis. (TAB. XXXIX.)

HAB. Port Natal, South Africa, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Frond 4–5 inches high, simple and stipe-like below, flabellately branched above, the branches dichotomous, fastigiate. Articulations of the stipe tolerably constant in form, the lowermost short and bead-like, the upper gradually more wedge-shaped, and the uppermost with prominent ear-like angles. Those of the branches, however, are so much varied that it is almost impossible to give an intelligible account of them. As a general rule, every articulation is either large or small, but otherwise there is little regularity. The smaller articulations are of several shapes, rounded, shield-like, fiddle-shaped, truncate, or eared, or winged: the larger are generally broadly lunate, with the outer side rounded, and the cusps incurved. *Fruit* unknown. *Colour*, a fine purple red.—Such is the usual form, but there are two varieties; the first less branched, with less dilated articulations; the second with branches ending in slender ramifications like those of *Jania rubens!* and each ramulus tipped with two or three dilated articulations.

Tab. 39. AMPHIROA STANGERI. Fig. 1. A frond:—*the natural size.* 2, 3. Portions of the same:—*magnified.*

25. AMPHIROA flabellata, *Harv.;* fronde elata gracilescente stipitata flabellatim ramosissima, ramis dichotomis fastigiatis, apicibus tenuibus, articulis basilaribus teretibus brevibus superne sensim cuneatis et compressis, articulis ramorum fere omnibus nisi supremis sagittato-auritis, auriculis patentibus acutis v. obtusis, terminalibus cylindraceis, ceramidiis ignotis. β. minor. (TAB. XXXIX.)

HAB. Port Natal, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Frond 4–6 inches high, with a simple stipe 2–3 inches long, forked at the summit; the divisions repeatedly and closely dichotomous, erecto-patent, fastigiate, forming a fan-shaped frond. *Articulations* of the stipe terete-compressed, rarely eared; those of the branches sagittate, with the lobes spreading, acute, or obtuse, sometimes much produced. The articulations of the terminal ramuli are generally terete, slender, and without ears. *Colour*, a bright reddish-purple.

Tab. 39. AMPHIROA FLABELLATA. Fig. 1. Frond:—*natural size.* 2, 3, 4. Portions of different parts of the same:—*magnified.*

26. AMPHIROA elegans, *Hook. fil. & Harv.;* fronde longiuscula gracili dichotoma, axillis remotis, articulis basilaribus teretibus diametro triplo longioribus mediis superioribusque sagittatis acutilobis, lobis subulatis erecto-patentibus, apicibus obtusis, ceramidiis in lobis articulorum immersis. (TAB. XXXVIII.)

HAB. New Zealand, *Rev. W. Colenso*, 630. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Two to three inches high, slender, irregularly dichotomous, the forks distant. *Ceramidia* immersed in the lobe of the articulation, opening on the upper margin, below the apex of the lobe.

Nearly allied to *A. acutiloba, Dne.*, but longer and more robust.

Tab. 38. AMPHIROA ELEGANS. Fig. 1. Frond:—*the natural size.* 2. Portion of the same. 3. Apex of a branch after maceration in acid. 4. Fertile lobe of an articulation, with immersed ceramidium:—*all magnified.*

27. AMPHIROA cultrata, *Harv.;* fronde gracili plano-compressa dichotoma, axillis patentibus, articulis basilaribus teretibus brevissimis vel diametro vix duplo longioribus mediis superioribusque applanatis cordato-sagittatis, lobis cultriformibus compressis lato-subulatis mucronatis, apicibus obtusis, ceramidiis in lobis articulorum immersis. (TAB. XXXIX.)

HAB. Port Natal, *Gueinzius.* Algoa Bay, *Herb. Bowerbank.* (*v. s. in Herb. T. C. D.*)

Frond 1–3 inches long, variable in habit. I have three varieties, the first of which is three inches high, slender, and much branched; the second, intermediate; and the third an inch high, densely tufted and dull in colour; appearances probably caused by locality. In all, the form of the articulations is very similar. *Ceramidia*, as in the preceding, concealed in the swollen ears of the fertile articulations.

Tab. 39. AMPHIROA CULTRATA. Fig. 1. The frond:—*the natural size.* 2. Portion of a barren; and 3, of a fertile branch:—*magnified.*

28. AMPHIROA sagittata, *Dne.;* "dichotoma, articulis sagittatis extremitatibus acutis vel ovariiferis." *Lamour. in Frey. Voy. Zool.* p. 625. t. 95. fig. 11–12. *Sond. in Pr. Pl.* vol. ii.

HAB. Mauritius, *Freycinet.* Swan River, *M. Preiss, fide cl. Sonder.* Algoa Bay, *Herb. Bowerbank.*

A larger plant than the preceding.

29. AMPHIROA Lamourouxiana, *Dne.;* "elongata apice curvata, articulis obcordatis lobis acutis adpressis, superioribus teretibus." *Dne. Class.* p. 113.

HAB. Cape of Good Hope, *Capt. Carmichael in Herb. Lamouroux.*

30. AMPHIROA fastigiata, *Dne.;* "articulis infimis depressis subquadratis minutis mediis obcordato-cuneatis, lobis acutiusculis ascendentibus, supremis obtusis rotundatis." *Dne. l. c.* p. 113.

HAB. —— *Herb. D'Orbigny, fide Decaisne.* Probably from South America.

GENUS 2. CORALLINA, *Linn.*

Frons articulata, calcarea, geniculis brevissimis. *Ceramidia* terminalia, ovata v. urceolata, apice poro pertusa, fasciculum sporarum pyriformium foventia. *Sporæ* demum zonatim quadripartitæ. Algæ *cosmopolitanæ*, pinnatim ramosæ, raro subdichotomæ. *Articuli* sæpius cuneiformes, plus minus compressi.

1. CORALLINA armata, *Hook. fil. et Harv.*; fronde brevi basi incrassata stipitata apice flabellata, ramis subfasciculatis creberrimis bipinnatis latissimis fastigiatis, articulis infimis applanatis processibus spinæformibus onustis, mediis lato-obcuneatis plano-compressis brevibus apice spinis 2–4–6 verticillatis armatis, superioribus cuneatis lævibus diametro sesquilongioribus, ramulorum teretibus gracilibus diametro 2–4 plo longioribus, apicibus obtusis sæpe capitatis, ceramidiis ovatis. (Tab. XL.)

HAB. New Zealand, *Rev. W. Colenso*, No. 224 and 654. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 1–2 inches high, with a stout, simple stem, having at its summit several densely crowded fastigiate branches. *Branches* bipinnate, the divisions spreading. *Articulations* of the stipe short, very broad and compressed, crowned with spines and sometimes concealed under other spinous processes issuing from the disc; of the branches rather narrower, but broadly obconic, crowned with 2–6 subulate spines; of the pinnæ more slender, and either naked, or furnished with two apical spines, one at each outer angle; of the *ramuli* quite cylindrical, slender, 3–4 times as long as broad. *Ceramidia* plentiful, terminating the ramuli. *Colour*, a dull purple.

Tab. 40. CORALLINA ARMATA. Fig. 1. The frond:—*of the natural size.* 2, 3. Portions of the same. 4. Articulations from the stipe. 5, 6. Fertile ramuli. 7. Vertical section of a ceramidium:—*all magnified.*

2. CORALLINA Berterii, *Mont.*; fronde brevi gracili basi simplici apice crebre bipinnata, pinnis elongatis applanatis, pinnulis brevissimis, articulis infimis cuneatis, caulinis sensim latioribus, mediis superioribusque deltoideis lateribus alæformibus apicibus arcuato-truncatis margine simplicibus v. crenatis, ramulorum brevissimis obovatis sæpe incrassatis v. in ceramidia mutatis, apicibus obtusissimis. *Mont. in Fl. Chil. ined.*

HAB. Chili, *Bertero in Herb. Mont.* (*v. s. in Herb. T. C. D. comm. cl. Montagne.*)

1–2 inches high. *Stems* slender below, broader and more compressed upwards, bi-pinnate above; the pinnæ long and simple, the pinnules exceedingly short, and mostly formed of single articulations, frequently geminate. Lower articulations cuneate, subcompressed; upper ones much broader and flatter, ribbed in the centre, with wide, wing-like margins, in shape not unlike the body of a *skate*-fish.

3. CORALLINA chilensis, *Dne.*; fronde brevi dense cæspitosa apice pinnata v. bipinnata, pinnis crebris subfasciculatis, articulis infimis caulinisque cuneatis compressis diametro sesquilongioribus, superioribus obovatis latioribus longioribusque sæpe palmatis vel apice profunde laciniatis, ramulorum gracilibus cylindraceis simplicibus vel apice trifidis, ceramidiis ovatis terminalibus. *Dne. in Herb. Paris. ined.*

HAB. Chili, *Herb. Paris.* Valparaiso (No. 2151) and Port Famine (No. 1840), *Mr. Darwin.* Norfolk Island, *Herb. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

1–2 inches high, bi-tri-pinnate above, the pinnæ long, erecto-patent, the upper ones gradually shorter. *Articulations* of the stem and branches once and half as long as broad, cuneate, simple, the upper ones longer and more expanded towards the apex, very irregular in shape, often laciniate or crenate; the apical ones, especially, frequently palmate.

Nearly allied to *C. palmata*, Kg. and to *C. Deshayesii*, Mont. The Port Famine specimens have a *starved* look, and probably grew near high-water mark. Those from Valparaiso are more developed, and serve for the type of the species. The plant also occurs in a mixed bundle received from Mr. Darwin and marked "S. America." The Norfolk Island specimens in Herb. Hooker are slightly different.

4. **Corallina officinalis, *Linn.*; fronde pinnata vel bi-pinnata, articulis inferioribus cylindraceis diametro duplo longioribus superioribus obconicis tereti-compressis apice simplicibus, ramulis cylindraceis, obtusis. *Harv. Phyc. Brit.* t. 222. β. *caloclada*; (Amphiroa caloclada, *Dne.*); articulis mediis superioribusque ceramidiis spuriis mamillæformibus densissime onustis.**

Hab. Falkland Islands (No. 1143) and Chonos, Chiloe (No. 2423), *Mr. Darwin* (both debilitated varieties.) Cape of Good Hope. (*v. s. in Herb. T. C. D.*)

A very variable, cosmopolitan species. The var. *caloclada* is exceedingly unlike the common form, and exhibits fruit at first sight so like the fruit of an *Amphiroa*, that it may readily be taken for one of that genus; nor should I venture to decide otherwise had I not before me a suite of specimens of undoubted *C. officinalis* collected by myself from the shore near Dublin, among which I find every degree of change from the common state to the abnormal one. A ramulus from one of these speci- is figured in *Phyc. Brit.*

5. Corallina loricata, *Kg.*; "minuta, basi attenuata, subramosa, ramis brevibus oppositis articulis inferioribus teretibus diametro parum longioribus vel subæqualibus, superioribus alatis cuneatis apice profunde emarginatis." *Kütz. Phyc. Gen.*

Hab. Cape of Good Hope, *Kützing*.

Species inquirenda.

6. Corallina capensis, *Leach; in Herb. Lamour. ined.*

Hab. Cape of Good Hope.

Genus 3. JANIA, *Lamour.*

Frons articulata, calcarea, geniculis brevissimis. *Ceramidia* terminalia vel axillaria, ovata, turbinata vel urceolata, ramulis binis vel quaternis corniformibus cristata, apice poro pertusa, fasciculum sporarum pyriformium foventia. *Sporæ* demum zonatim quadri-divisæ. Algæ *cosmopolitanæ*, dichotomæ vel pinnatim ramosæ, gracillimæ. *Articuli* teretes vel compressi, nunc cylindracei, nunc obcuneati.

* HALIPTILON. *Frons pinnatim composita.*

1. **JANIA** rosea, *Dne.*; fronde plumosa indivisa vel pinnatim ramosa, ramis virgatis subtripinnatis, pinnis pinnulisque brevibus creberrimis gracillimis subcapillaribus, pinnulis sæpius furcatis vel bipartitis, articulis ramorum diametro equalibus lato-obcuneatis angulis prominulis, ramulorum linearibus diametro 3-plo longioribus, apicibus acutis, ceramidiis terminalibus antennatis urceolatis. (TAB. XL.)

HAB. Coast of Australia. King George's Sound, *Mr. Darwin*, 3558, &c. (*v. s. in Herb. T. C. D.*)

Two to three inches high, densely tufted. *Fronds* either simple or pinnately divided, the divisions long, and closely bi-tripinnate with short and very slender ramuli. *Articulations* of the branches large compared to those of the ramuli, beadlike.

Tab. 40. JANIA ROSEA. Fig. 1. Frond :—*natural size.* 2. Part of a branch. 3. Ramuli and ceramidia :—*magnified.*

2. **JANIA** Cuvieri, *Dne.*; fronde plumosa pinnatim composita, ramis crebris virgatis subtripinnatis, pinnis pinnulisque creberrimis gracilibus, pinnulis simplicibus vel furcatis, articulis ramorum diametro sesqui-vel duplo longioribus lato-obcuneatis angulis prominulis, ramulorum linearibus diametro 2–3-plo longioribus, ceramidiis terminalibus antennatis urceolatis.

HAB. Coasts of Australia, Tasmania, New Zealand, &c.; common. Port Natal? *Gueinzius.* (*v. s. in Herb. T. C. D.*)

A larger and less delicate plant than the preceding, but so similar that I cannot satisfactorily express the differences in words. In *J. rosea* the ramuli are much more slender in proportion to the branches than in *J. Cuvieri.* The Port Natal specimens are very like those from New Holland, yet not exactly the same.

3. **JANIA** Hombronii, *Mont.*; "ramosissima, tripinnata, pinnis confertis flabellatis, articulis rachidis inferne teretibus superne obcuneato-truncatis compressis longitudine diametro subæqualibus, ramulorum teretibus apice aut ovato-globosis conceptaculigeris aut filiformibus sterilibus diametro duplo triplove longioribus." *Mont. Pol. Sud. Bot. p.* 146.

HAB. Lord Auckland's Island, *D'Urville, Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

A much coarser plant than *C. Cuvieri.*

4. **JANIA** pistillaris, *Mont.*; "laxe bipinnata, pinnis pinnulisque remotis patenti-erectis, articulis rachidis compressis subparallelogrammis apice parum dilatatis diametro duplo longioribus, pinnulis simplicibus teretibus apice discoideo- vel capitato-incrassatis tetrasporophoris." *Mont. Pol. Sud. Bot. p.* 147.

HAB. Bay of Islands, New Zealand, *M. Hombron.*

5. **JANIA** gracilis, *Mont.*; "purpurea, ramis elongatis flexilibus, articulis inferne teretibus superne compressis, ramulorum filiformibus." *Mont. l. c. p.* 147.

CORALLINA gracilis, *Lamx. Polyp. Flex.* p. 288.

HAB. Island of Akaroa, New Zealand, *M. Hombron.*

6. JANIA PANICULATA, *Dne.;* "ramosa dichotoma rare trichotoma, articulis compressis subulatis ramulosis, ramulis paniculatis teretibus." *Lamx. in Freyct. Voy. Zool.* p. 626.

HAB. Isle of France.

7. JANIA granifera, *Dne.;* fronde gracili pinnatim composita subtripinnata, pinnis crebris vel remotis elongatis bipinnatis, pinnulis longiusculis gracilibus sensim attenuatis, ramulis ultimis capillaribus simplicibus, articulis ramorum subcylindraceis vix obcuneatis diametro duplo longioribus, ramulorum linearibus diametro 3–4-plo longioribus, ceramidiis longe pedicellatis urceolatis vel pyriformibus antennatis vel sæpe simplicibus. *Dne. Class. p.* 111., &c.

HAB. Tasmania, *Mr. Gunn, Rev. Mr. Ewing,* &c. (*v. s. in Herb. T. C. D.*)

A less regularly branched and more slender plant than *C. Cuvieri,* with less difference between the diameter of its branches and ramuli, and not closely feathered like the preceding species. Pinnæ and pinnules often remote; the latter long and simple.

8. JANIA subulata, *Sond.;* fronde dichotoma fastigiata flabelliformi, ramis creberrime pinnulatis vel bipinnulatis vel ramulis crispatis undique obsessis, pinnulis capillaribus brevissimis moniliformibus furcatis sensim attenuatis, articulis ramorum subrotundis vel quadratis diametro equalibus moniliformibus, ramulorum ellipticis diametro duplo longioribus, ceramidiis breve pedicellatis urceolatis. *Sonder, Pl. Preiss.* vol. ii. p. 186. (TAB. XL.)

β. *crispata;* **ramis ramulisque crispatis, ramulis undique insertis numerosissimis.** ***J. crispata,*** *Lamx. Pol. Flex.* p. 289. t. 10. f. 3.

CORALLINA subulata, *Ellis, Cor.* p. 119. no. 23. t. 21. f. 6. B.

HAB. Common on the stems of *Caulinia antarctica,* on the shores of New Holland, Tasmania, &c. (*v. s. in Herb. T. C. D.*)

A variable plant, but readily known by its dichotomous moniliform main branches, pinnulated with very short capillary ramuli. Ellis's figure is so characteristic that I can scarcely question Mr. Sonder's reference to it, although Ellis's specimen is said to have come from the West Indies.

* * JANIRA. *Frons dichotoma, sæpius fastigiata.*

9. JANIA tenuissima, *Sond.;* "dichotoma, fastigiata, submoniliformis, ramis divaricatis, articulis diametro sublongioribus, ceramidiis ovatis." (TAB. XL.) *Sond. in Pl. Preiss.* 2. p. 186.

HAB. Swan River, *Preiss.* King George's Sound, *Darwin,* no. 3558. (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

Very slender, dichotomous, divaricate, the forks widely spreading. *Articulations* moniliform, short, striate longitudinally.

TAB. 40. JANIA TENUISSIMA. Fig. 1. Tuft:—*the natural size.* 2. Branches. 3. Apex of a branch:—*magnified*

10. JANIA antennina, *Kg.*; "dichotoma, fastigiata, submoniliformis, ramis erectiusculis, articulis diametro subæqualibus, ceramidiis ovatis subproliferis." *Sond. l. c.* p. 186. *Kutz. Phyc. gen.* p. 389.

HAB. New Holland, *Kutzing.* Swan River, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Kutzing.*)

Closely related to the preceding, but more robust. Both seem to come very close to the following.

11. JANIA micrarthrodia, *Lamour.*; articulis brevibus, approximatis. *Lamour. Pol. flex.* p. 271. t. 9. f. 5.

HAB. Australia, upon *Fuci*; *Lamouroux.*

12. JANIA rubens, *Lamour.*; fronde brevi cæspitosa dichotoma fastigiata, axillis patentibus, ramis strictis curvatis vel arcuatis filiformibus, articulis cylindraceis diametro 4–6-plo longioribus ceramidiis axillaribus terminalibusque. *Lamx. Pol. flex.* t. 9. fig. 6, 7. *Harv. Phyc. Brit.* t. 252. &c.

HAB. Port Natal, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Very like the European form of this widely dispersed plant.

13. JANIA fastigiata, *Harv.*; fronde elata fastigiata dichotoma axillis acutissimis, ramis strictis erectis, apicibus subinflatis, articulis omnibus cylindraceis infimis diametro sesquilongioribus superioribus duplo vel subtriplo longioribus, geniculis constrictis; ceramidiis terminalibus longissime antennatis.

HAB. Algoa Bay, South Africa, *Herb. Bowerbank.* (*v. s. in Herb. T. C. D. comm. cl. Bowerbank.*)

Fronds 2–3 inches high, finely tufted, fastigiate. *Stems* as thick as hogs' bristle, of nearly equal diameter throughout, repeatedly forked, having all the divisions very erect, and all the branches of equal height. *Articulations* short. *Colour* a fine rosy red.

14. JANIA Natalensis, *Harv.*; fronde elata fastigiata dichotoma axillis acutis, ramis erectis strictis curvatisque apicibus acutis, articulis omnibus cylindraceis infimis diametro duplo-triplove superioribus sextuplo- v. octuplo longioribus, ceramidiis (*ignotis*).

HAB. Port Natal, South Africa, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Frond 2–3 inches high, more robust than the preceding, and with far longer articulations. *Colour* dull purple.

Genus 4. MASTOPHORA, *Dne.*

Frons stipitata, plana, calcareo-coriacea, flexilis, flabelliformis vel dichotomo-fastigiata, margine sæpe inflexo. *Ceramidia* conoidea, convexa, sessilia, per totam frondem sparsa. Algæ *tropicæ* vel *australes*, speciosæ, frondosæ, purpureæ, sæpius transversim striatæ vel zonatæ.

1. Mastophora Lamourouxii, *Dne.;* stipite elata angusta canaliculata pluries furcata, ramis fastigiatis supra in frondem cuneato-flabelliformem incisam tenuem concentrice striatam expansis, margine inflexo, pagina inferiore pruinosa, ceramidiis magnis submarginalibus. (Tab. XLI.) *Dne. Ess.* p. 114. *Endl. 3rd. suppl.* p. 50.

Hab. Port Natal, South Africa, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Frond 4–5 inches high, with a rigid but flexible subcartilaginous, slender channelled stem, much branched dichotomously, the branches ending in cuneate or flabelliform cloven or variously lobed laciniæ, whose margin is strongly inflexed. Apices and axils rounded. Upper surface finely chagrined and marked with minute concentric striæ, purple; the lower glaucous, like the surface of a plum. *Ceramidia* very large and prominent.

Tab. 41. Mastophora Lamourouxii. Fig. 1. Frond:—*the natural size.* 2. Portions of a frondlet showing both surfaces. 3. Part of the same, after the removal of the lime by acid. 4. Cellular structure. 5. Vertical section of a ceramidium:—*all magnified.*

2. Mastophora plana, *Sond.;* "plana, fronde tenui expansa subdichotoma lobata, segmentis elongatis cuneatis apice bifidis, laciniis obtusis planis, ceramidiis hemisphericis sparsis." *Sond. in Pl. Preiss.* vol. ii. p. 188.

Hab. Swan River, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Sonder.*)

Three inches long, membrano-coriaceous, dull red, the segments fastigiate, from three to five lines wide at the tips, narrowed gradually to the base. The whole frond zoned with minute concentric striæ. *Ceramidia* large, scattered.

3. Mastophora flabellata, *Sond.;* "fronde tenui expansa irregulariter divisa, segmentis elongatis angustis apice flabellatis integris vel 2-3-lobatis, lobis rotundatis apice marginibusque subinvolutis, ceramidiis hemisphericis sparsis." *Sond. in Pl. Preiss.* vol. ii. p. 188.

Hab. Swan River, *Preiss.* (*v. s. in Herb. T. C. D.*)

Nearly related to the preceding, but less regularly divided, with broader and thinner segments.

4. Mastophora hypoleuca, *Harv.;* stipite elata angusta canaliculata pluries furcata, ramis supra in frondem cuneiformem furcatam expansis, laciniis linearibus margine involuto, pagina inferiori albo-lanata stictis nigris depressis conspersa. (Tab. XLI.)

Hab. Port Natal, South Africa, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Frond 3-4 inches high, much branched, irregularly dichotomous, not fastigiate. *Branches* ending in cuneate, forked segments, whose margins are strongly rolled in and apices obtuse. Upper surface shagrined and striate; lower covered with a short, white, woolly down, and dotted all over with minute, dark-coloured, depressed, naked spots. *Ceramidia* large and prominent. *Colour*, a dull brownish purple.

Tab. 41. MASTOPHORA HYPOLEUCA. Fig. 1. Part of a frond: — *the natural size.* 2. Apex of a segment, showing the under surface. 3. A ceramidium, after the removal of the lime by acid:—*both magnified.*

GENUS 5. MELOBESIA, *Lamour.*

Frons libera vel adnata, calcarea, polymorpha; plana, orbicularis vel lobata; vel globosa; vel cylindracea et ramosa. *Ceramidia* hemispherica, sæpius depressa, per totam frondem sparsa. Algæ *cosmopolitanæ* e mari profundiori enatæ, saxicolæ, vel algis majoribus adnascentes, nunc tenues, membranaceo-crustaceæ, nunc incrassatæ et lapidescentes.

1. MELOBESIA mamillaris, *Harv.*; late incrustans, saxicola, suborbicularis, crusta tenui arcte adnata mamillis densissimis brevibus demum elongatis ramosis exasperata, ceramidiis in apicibus mamillarum immersis. (TAB. XLI.)

HAB. Bahia (Brazil) in tidal pools, *Mr. Darwin*, No. 3854, 3855, 3856; also Port Famine, Terra del Fuego, No. 1840, 99, 197; St. Jago, Cape Verde; Algoa Bay, *Herb. Bowerbank.* (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

Spreading over stones in a thin crust, covered when young with closely set, mamillary tubercles, which gradually lengthen into erect terete branches, becoming divided and massed together, and form eventually a thick crust, composed of interlacing branches. *Ceramidia* sunk in the tips of the mamillæ. "In one case I found a cone (*ceramidium*) placed on one side, instead of on the summit, of a branch. The greater number of the branches have white, rounded ends, and on some of these there were appearances, as if a ceramidium had once existed there, and had since scaled off. In some branches there were traces of cavities low down in them. *Colour*, on the under surfaces of the branches paler than in *Corallina officinalis*, in other parts creamy, with a tinge of flesh-red." *Darw. MSS.*

Tab. 41. MELOBESIA MAMILLARIS. Fig. 1. Frond, on a stone:—*the natural size.* 2. 3. Portions, of different ages. 4. A mamillary fertile branch. 5. A section of its apex, with ceramidium after maceration in acid:—*magnified.*

2. MELOBESIA Darwini, *Harv.*; fruticosa, ponderosa, ramosissima, ramis densissime aggregatis erectis in massam crassam congestis, ramulis verticalibus apice conoideis.

HAB. King George's Sound, *Mr. Darwin.* (*v. s. in Herb. T. C. D. comm. cl. Darwin.*)

Forms large masses of unknown extent, two or three inches in height, wholly built up of cylindrical, branching, stony fronds, soldered together, with all the divisions very erect; the ultimate ones free, and mamillæform. The whole plant not unlike a mass of stalagmites.

3. **Melobesia** Brassica-florida, *Harv.*; fronde lapidescente ponderosa globosa e centro undique ramosissimo, ramis basi anastomosantibus apice multifidis corymboso-fasciculatis fastigiatis apicibus mamillæformibus.

Hab. Algoa Bay, *Herb. Bowerbank.* (*v. s.*)

Masses globose, 2-3 inches in diameter, branched from the centre, and strongly resembling a petrified head of cauliflower.

4. **Melobesia** calcarea, *Ell. and Sol.*; fruticosa, ramosissima, ramis lapidescentibus gracilibus vage ramosis, ramulis rugosis et papilliferis divaricatis. *Ell. and Sol. p.* 129. t. 23. f. 13.

Hab. New Zealand, *Dr. Hooker.* Galapagos, in 12 fathoms, *Mr. Darwin*, No. 3251. (*v. s. in Herb. T. C. D.*)

Fronds like stony little shrubs, with distant, much divided, slender divisions, spreading on all sides.

I venture to refer these specimens to a British form of the genus, which they nearly resemble.

5. **Melobesia** polymorpha, *Linn.*; fronde lapidescente ponderosa polymorpha incrustante lobata, lobis hemisphericis vel amorphis, ceramidiis minutis densissime sparsis.

Hab. Algoa Bay, *Herb. Bowerbank.* Chonos, *Mr. Darwin.* No. 2478? (*v. s. in Herb. T. C. D.*)

Several inches in diameter, an inch or two thick, forming an amorphous crust, or rising into short lumpy lobes. *Ceramidia* very minute, densely aggregated.

6. **Melobesia** scabiosa, *Harv.*; late effusa, saxicola, orbicularis, crusta tenui rugis minutis asperata, ceramidiis minutissimis punctiformibus numerosis sparsis.

Hab. On stones, at Bahia, *Mr. Darwin.* No. 3857. (*v. s. in Herb. T. C. D.*)

"A distinct and very common species, coating smooth surfaces in tidal pools: colour darkish." *Darw.*

7. **Melobesia** pustulata, *Lamour.*; fronde crassiuscula incrustante polymorpha algicola, ceramidiis minutis pustuliformibus densissime sparsis.

Hab. Parasitical on various Algæ. Norfolk Island. *Dr. M'William.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds half an inch to an inch long, spreading over the surface of Algæ or clasping the filiform ones, smooth, of indeterminate figure, densely warted with minute pimple-like ceramidia. *Colour*, lurid purple or greenish.

8. **Melobesia** amplexifrons, *Harv.*; fronde laxe amplectente crassa lobata rugosa, ceramidiis minutissimis immersis umbilicatis fere poriformibus.

HAB. Port Natal, on *Gelidium*, *Dr. Gueinzius.* (*v. s. in Herb. T. C. D.*)

Allied to *M. pustulata,* but larger, with a much thicker crust, and singularly small, deeply sunk ceramidia.

9. MELOBESIA crassiuscula, *Kg.;* "suborbicularis, foliacea, crassiuscula, obsolete lobata, sub-undulata." *Kg. Phyc. Gen.* p. 386.

HAB. Cape of Good Hope, on *Gelidium cartilagineum ; Kützing.*

10. MELOBESIA membranacea, *Lamour.;* frondibus perpusillis dense aggregatis tenuibus orbicularibus, ceramidiis 2-3 hemisphericis centralibus.

HAB. On leaves of *Caulinia,* &c.; Swan River. On *Gelidium,* at the Cape of Good Hope. (*v. v. et s. in Herb. T. C. D.*)

Minute, much crowded, 1-2 lines broad, scale-like. *Ceramidia* rather prominent, 2 or 3 to each frond. *Colour,* a pale pinky red.

11. MELOBESIA lichenoides, *Ellis;* fronde basifixa laminata foliiformi decumbente varie lobata, lobis flexuosis concentrice striatis, ceramidiis conoideo-hemisphericis magnis prominentibus sparsis. *Ellis, Phil. Trans.* 57. p. 419. *t.* 17.

HAB. Attached to stones and algæ between tide marks. Norfolk Island, *Dr. M'William.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Forming foliated patches from one to six inches or more in diameter, consisting of numerous overlaying laminæ, variously lobed and concentrically striate, resembling one of the semifoliaceous lichens. *Ceramidia* of large size and very prominent. *Colour,* pale red or creamy.

12. MELOBESIA Patena, *Hook. fil. and Harv.;* fronde basi-fixa horizontali obovata vel suborbiculari applanata crassiuscula concentrice striata nitida, margine integerrimo crasso plano, ceramidiis orbicularibus depressis sparsis. (TAB. XL.)

HAB. New Zealand, on *Ballia, Rev. W. Colenso,* No. 1331. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Fronds $\frac{1}{4}$-$\frac{3}{4}$ inch long, fixed by a groove in the base which clasps round the stem to which they attach themselves, otherwise free, horizontal, flat, or slightly concave, obovate, or suborbicular, very entire, with a flat and slightly thickened margin. *Ceramidia* numerous, scattered, depressed. *Colour* rather a deep, purplish red.

A pretty little species, named from its resemblance to the ecclesiastical vessel, called a *Patena.*

Tab. 40. MELOBESIA PATENA. Fig. 1. Numerous fronds, of various ages, growing on old stems of *Ballia.* 2. Portion of a frond. 3. Section of the same :—*magnified.*

13. MELOBESIA antarctica, *Hook. fil. and Harv.;* fronde circumscriptione orbiculari lobata medio adnata margine integerrima libera superficie lævi lineis concentricis undulata, ceramidiis depresso-hemisphericis. *Fl. Antarct.* vol. ii. p. 482.

Hab. Hermite Island, Cape Horn; Falkland Islands and Kerguelen's Land: on various Algæ, especially *Ballia*, *Dr. Hooker*.

Perhaps a variety of *M. Patena,* but less regular in form, and more adnate.

Fam. 4. DELESSERIEÆ.

Delesserieæ, *J. Ag. in Linn.* xv. p. 8. *Alg. Medit.* p. 116. *Endl. 3rd. Suppl.* p. 52. *Lindl. Veg. King.* p. 25. Gasterocarpeæ (partim), *Dne. Class.* p. 65. Thamnophoreæ (partim), *Dne. l. c.* p. 63. Delesserieæ and Plocameæ, *Kütz. Phyc. Gen.* p. 442. and p. 449.

Frons cellulosa, continua, areolata; sæpius foliacea, expansa; nunc plano-compressa, decomposita; nunc (rarissime) filiformis; e cellulis polygonis inordinatis conflata. *Cellulæ periphericæ* nunquam in fila horizontalia connexæ. *Fructus* duplex; 1, *Conceptacula* externa (*coccidia* dicta), globosa v. hemispherica, intra pericarpium membranaceum clausum (rarissime apice pertusum) massam sporarum cuneatarum ad fila fasciculata affixarum, foventia. 2, *Tetrasporæ* in soris definitis vel in sporophyllis propriis (*stichidiis*) collectæ, sæpius triangule partitæ, raro zonatæ.

The plants of this family are remarkable among Rhodosperms for expanded leaf-like fronds, often nerved, and almost always of delicate texture, and of a clear rosy colour. In a few instances the frond is lurid purple; and in *Plocamium* and *Soliera* it is narrow-linear or filiform and much branched. It is never articulated, and the surface cells are usually of large size and irregular form, not arranged in transverse lines. By most authors the Delesserieæ are regarded as superior in organization to the Rhodomeleæ; but, in my opinion, the fructification of the latter family is constructed on a higher type; and although the frond in the less developed plants of the group—as in *Polysiphonia*—is simpler than we find among Delesserieæ, still, in such plants as *Claudea* and *Amansia,* we have more delicate structures than in any Delesseriea. The two families, *Rhodomeleæ* and *Delesserieæ,* approach much nearer to each other than would be, at first sight, supposed, nor is it always very easy to determine the limits between them. The forms of conceptacle called *ceramidium* and *coccidium* do indeed, in typical cases, appear distinct; the one ovate, pierced by a pore; the other spherical, and closed. But in *Hymenena* the coccidia are depressed at the top, and have a minute opening; and in *Hemineura* they seem to pass into regular ceramidia. I have hesitated whether to place the last named genus here, or among *Rhodomeleæ;* and in the position I have given to it have been more guided by its habit, and the arrangement of tetraspores, than by the structure of its conceptacles. If it be removed to *Rhodomeleæ,* it would range naturally near *Pollexfenia,* a genus which has all the *habit* of a *Nitophyllum.*

None of the following genera, except *Hemineura,* are peculiar to the Southern Ocean. *Botryoglossum* and *Hymenena* occur on the north-west coast of America; and the remaining genera are cosmopolitan. *Delesseria ? Leprieurii* is curiously dispersed; its stations are New York, Demarara, and New Zealand. *D. quercifolia* strikingly resembles the northern *D. sinuosa,* but differs in the position of its tetraspores; while *D. crassinervia* is scarcely distinguishable from the northern *D. Hypoglossum.* *Plocamium coccineum* is found throughout the temperate waters of both hemispheres, and extends in both nearly to the circumpolar regions; but all the other species of this beautiful genus are southern. *P. Magellanicum* is scarcely a congener with the others.

CONSPECTUS
GENERUM DELESSERIEARUM.

* *Frons* foliacea, symmetrica, costata.

I.—DELESSERIA. *Costa* frondem percurrens.

II.—HEMINEURA. *Costa* tenuis, basi et apici laciniarum evanescens.

* * *Frons* foliacea, vage ramosa, ecostata, vel costa obsoleta, vel nervis irregularibus ramosis evanescentibus peragrata.

III.—BOTRYOGLOSSUM. *Frons* costa crassa, sursum deliquescente instructa.

IV.—HYMENENA. *Frons* ecostata, nervis parallelis anastomosantibus peragrata. *Sori* lineares, inter nervos dispositi.

V.—NITOPHYLLUM. *Frons* ecostata nervosa vel nervis vage ramosis peragrata. *Sori* subrotundi, sparsi.

* * * *Frons* linearis vel filiformis, decomposite ramosa, ramis alternis, ramulis pectinato-secundis.

VI.—PLOCAMIUM.

GENUS 1. DELESSERIA, *Lamour.*

Frons membranacea, plana, symmetrica, costa percurrente instructa, reticulata. *Coccidia* hemispherica, sæpius costa semi-immersa, sporas e filis articulatis fasciculatis ortas foventia. *Tetrasporæ* in soris definitis, per frondem sparsis vel in sporophyllis propriis, triangulatim quadripartitæ. Algæ *cosmopolitanæ*, amœne roseæ vel purpureo-sanguineæ, foliaceæ vel pinnatifidæ, raro dichotomæ, costa sæpius valida, nervisque tenuibus.

1. DELESSERIA sanguinea, *Lamour.*; caule tereti cartilagineo ramoso, foliis oblongis vel obovatis integerrimis penninerviis, costa valida, nervis oppositis, coccidiis et sporophyllis costæ denudatæ insidentibus pedicellatis. *Harv. Phyc. Brit.* t. 151. *etc.* var. *lancifolia, Hook. et Harv.*; fronde angusta, lineari-lanceolata utrinque angustata. *Fl. Antarct.* vol. ii. p. 470.

HAB. Hermite Island, Cape Horn, *Dr. Hooker* (*v. s. in Herb. T. C. D.*)

Stem thick and hard, bearing several oblong or obovate petioled leaves 4–12 inches long, and 1–4 inches wide, with the margin usually much waved, but not sinuated. *Colour*, a brilliant crimson-pink. In the var. *lanceolata* the leaves are very long and narrow, and taper to each end.

2. DELESSERIA Lyallii, *Hook. et Harv.*; fronde lineari-oblonga obtusa costata penninervi argute serrato-dentata, nervis oppositis, margine incrassato folia consimilia petiolata emittente, dentibus subulatis simplicibus vel latere inferiore plerumque erosis, coccidiis frondis pagina sparsis, tetrasporis in soris inter nervos laciniarum dispositis. *Fl. Antarct.* vol. ii. p. 471. t. 176.

HAB. Falkland Islands and Kerguelen's Land, *Dr. Hooker* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Primary leaf 4–9 inches long, ½–1 inch wide, petioled, oblong, very blunt, with a strong midrib, penninerved with opposite nerves, with the margin thickened and sharply toothed, but not sinuated. This primary leaf emits from the points of the lateral nerves other leaves in all respects similar to itself, and each of them distinctly petiolate, and these in like manner originate other leaflets which are at first obovate, and afterwards linear oblong. *Colour*, a deep blood-red.

3. DELESSERIA quercifolia, *Bory*; fronde ovata profunde bipinnatifida et sinuato-lobata denticulata costata penninervi, nervis oppositis, coccidiis (mihi ignotis), tetrasporis in soris minutis punctiformibus numerosissimis inter nervos laciniarum dispersis. *Bory in Duper. Vol. Bot.* p. 186. t. 18. f. 1. (TAB. XLVI.)

HAB. Hermite Island, Cape Horn, and Falklands, *Duperrey, Hooker*, &c. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 3–6 inches long, very variable in breadth and in the amount of division, pinnatifid or bipinnatifid, and irregularly lobed and sinuate, each lobe traversed by the ramifications

of the stout midrib, from which opposite nerves branch off to the tips of the lesser lobes. *Colour*, a purplish-red. Spots of tetraspores very numerous, densely scattered between the nerves.

TAB. 46. DEL. QUERCIFOLIA. Fig. 1. Frond :—*the natural size.* 2. Minute portions, with sori. 3. Tetraspores :—*both magnified.*

4. **DELESSERIA** Davisii, *Hook. fil. et Harv.;* caule cartilagineo alato, lamina profunde pinnatifida v. pinnata, laciniis pinnisve cultrato-lanceolatis obliquis costatis penninerviis, nervis alternis, demum inter nervos alterne vel secunde lacerato-laciniatis, lacinulis erecto-patentibus costatis. *Hook. Fl. Antart.* vol. ii. p. 470. t. 175.

HAB. Cape Horn and Falkland Islands, *Dr. Hooker and Dr. Lyall.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

5. **DELESSERIA** dichotoma, *Hook. fil. et Harv.;* costa crassa dichotoma frondem cuneatam obtusam vel emarginatam demum bifido-laciniatam percurrente infra apicem evanida, frondibus e costa denudata orientibus oblongis cuneatis rariusve elliptico-lanceolatis costa furcata, soris rotundatis maculatis coccidiis costalibus vel sparsis. *Hook. Fl. Ant.* vol. i. p. 185. t. 71. f. 2.

HAB. Lord Auckland's and Campbell's Islands, *Dr. Lyall.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

6. **DELESSERIA** endiviæfolia, *Hook. fil. et Harv.;* fronde lineari vage dichotoma membrana crispatissima alata, margine lobato, lobis demum dichotomo-multifidis obtusis, soris in lobulorum apicibus sparsis circularibus. *Hook. fil. et Harv. in Lond. Journ. Bot.* vol. vi. p. 403.

HAB. Tasmania. *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

7. **DELESSERIA** ruscifolia, *Lamour.;* caule ramoso alato, foliis late oblongis obtusis planis simplicibus e costa proliferis, venulis diaphanis catenatis, coccidiis costalibus solitariis, soris linearibus binis utrinque juxta costam positis. *Harv. Phyc. Brit.* t. 26. &c.

HAB. Cape of Good Hope. Tasmania, *Mr. Gunn.* Straights of Maghælens, *D'Urville.* (*v. v. et s. in Herb. T. C. D.*)

A small species, 1-3 inches high, with linear, obtuse, proliferous, deep crimson leaflets. Also a native of Europe.

8. **DELESSERIA** crassinervia, *Mont.;* " fronde lineari, valide costata limbo angustissimo sæpius deficiente instructa vage ramosa, ramis distichis utrinque sporophylla ovato-lanceolata e costa prodeuntia emittentibus ; conceptaculis . . . ." *Mont. Voy. Pol. Sud.* p. 164, t. 8, f. 1.

HAB. Auckland Islands and Campbell's Island, *D'Urville, Hooker.* Kerguelen's Island and Cape Horn, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

This species is compared to *D. sanguinea* by Dr. Montagne; but to judge by that author's figure, which closely agrees with one of Dr. Hooker's specimens in Herb. T. C. D., I regard it as more nearly related to *D. hypoglossum*, with which species some of Dr. Hooker's Falkland specimens inosculate; the nerve in them becomes narrower as the frond widens, until at last it is difficult to distinguish broad fronds from the common form of *D. hypoglossum*.

9. Delesseria crispa, *Sond.*; "pumila, fronde substipitata lineari-spathulata obtusa vel subemarginata integerrima e costa prolifera."

Hab. Swan River, *Preiss.*

10. Delesseria? Leprieurii, *Mont.*; "repens, fronde costata lineari dichotoma articulato-constricta, articulis oblongo-lanceolatis." *Mont. An. Sc. Nat.* xiii. p. 196, t. 5, f. 1.

Hab. New Zealand, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond half an inch to 3 inches long, dichotomous, rooting at the forks, the internodes linear-lanceolate; the branches gradually narrower upwards, traversed by a slender nerve. *Colour*, dull purple.

A very curious plant, first observed in Cayenne near the mouth of the Sinnamar River; then in the Hudson near New York; and lastly brought from the Bay of Islands, New Zealand. It is scarcely in its right place in Delesseria.

Genus 2. HEMINEURA.

Frons membranacea, plana, symmetrica, pinnatifida, costa tenuissima basi et apici laciniarum evanida. *Coccidia* costalia, cornuta, ore producto, sporas e filis articulatis fasciculatis ortas foventia. *Tetrasporæ* in soris definitis per frondem sparsis triangulatim quadripartitæ. Alga speciosa *australis*, rosea, latissima, bitripinnatifida, margine denticulato. *Sori* secus marginem ordinati.

1. Hemineura frondosa, *Hook. fil. et Harv. in Lond. Journ.* vol. vi. p. 403. (Tab. XLV.)

Hab. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond a foot long or more, delicately membranaceous, broadly ovate, pinnatifid or bi-tripinnatifid; laciniæ somewhat lanceolate, the lesser lobes very short and obtuse, serrulate. Midrib very slender, vanishing just below the apex, those of the laciniæ commencing opposite the base and disappearing below the apex of each lacinia. *Coccidia* placed on the costæ of the ultimate lobes, solitary, ovate-acuminate, with a prolonged horn-like apex, pierced by a pore. *Sori* of tetraspores oblong, ranged within the margin. *Colour*, a pale rose red.

Tab. 45. HEMINEURA FRONDOSA. Fig. 1. A frond :—*the natural size.* 2. Apex of a lacinia, with spots of tetraspores. 3. Small portion of the same. 4. Apex of lacinia with conceptacles. 5. A conceptacle :—*all more or less magnified.*

GENUS 3. BOTRYOGLOSSUM, *Kütz.*

(*Botryoglossum and Neuroglossum,* Kg.)

Frons caule cartilagineo filiformi apice in laminam vage fissam, basi costatam abeunte. *Costa* crassa, sursum deliquescens. *Coccidia* hemispherica, ore prominulo, mamillæformia, per frondem sparsa, semi-immersa, fasciculum sporarum e filis articulatis, fasciculatis enatarum foventia. *Tetrasporæ* in soris definitis, per frondem sparsis vel in sporophyllis propriis collectis, triangulatim quadripartitæ. Algæ *capenses* vel *antarcticæ,* necnon in *oceano pacifico* ad plagam occidentalem Americæ obviæ, habitu inter *Hymenenam et Delesseriam* mediæ, irregulariter ramosæ vel laciniatæ, purpureæ, siccitate fuscescentes.

1. BOTRYOGLOSSUM platycarpum, *Kütz.;* soris tetrasporarum in sporophyllis propriis parvis pedicellatis axillaribus vel marginalibus fasciculatis. *Kütz. Phyc. Gen.* p. 446. *Turn. Hist.* t. 144.

Delesseria platycarpa, *Ag. Syst.* p. 252.

HAB. Cape of Good Hope, Falkland Islands, &c. (*v. v. et s. in Herb. T. C. D.*)

Frond 8-18 inches long, much branched, irregularly dichotomous. *Stem* naked below, terete, cartilaginous, gradually becoming winged with membrane upwards and ending in variously cleft membranous leafy expansions, about the middle of which all trace of stem or costa is lost. Margin either even or fringed. *Tetraspores* contained in small leafy processes, which either fringe the margin or are dispersed over the surface. *Colour,* a brownish or purplish red.

2. BOTRYOGLOSSUM (*Neuroglossum*) Binderianum, *Kütz.;* soris tetrasporarum per lacinias frondis dispersis. *Kütz. Phyc. Gen.* p. 446.

HAB. Cape of Good Hope. Coast of Chili. (*v. v. et s. in Herb. T. C. D.*)

Very similar to the preceding in habit, but with a less evident distinction into stem and leaves, and readily distinguished by the sori of tetraspores being situated, not in little sporophylli, but in the expanded laciniæ of the frond itself. I am unwilling, with Kützing, to place this plant in a separate genus, on account of the different position of the tetraspores. The habit of the two plants is very similar.

GENUS 4. HYMENENA, *Grev.*

Frons membranacea, plana, vage fissa, ecostata nervis prominentibus anastomosantibus subparallelis creberrimis peragrata. *Coccidia* e nervis enata, sparsa, apice depresso-umbilicata, pertusa, intra pericarpium crassissimum stratum sporarum ad placentam basilarem foventia. *Tetrasporæ* in soris elongatis inter nervos laxe dispositæ. Algæ *Capenses et Pacificæ*, purpureo-roseæ, iridescentes, crispæ, radice ramoso.

1. HYMENENA fissa, *Grev.;* fronde palmatim fissa, laciniis cuneato-linearibus undulatis obtusissimis erectis margine integerrimo. *Fucus venosus, Turn. Hist.* t. 138. (TAB. XLIV.)

HAB. Cape of Good Hope. (*v. v. et s. in Herb. T. C. D.*)

Root branching. *Frond* 6-12 inches long, palmate or irregularly dichotomous, broadly cuneate in outline. *Laciniæ* linear-oblong simple or lobed, undulate, with an entire margin. Every part of the frond is traversed by closely placed, longitudinal, anastomosing, prominent nerves, on which the *coccidia* are formed, and between which the tetraspores are scattered in long, lax sori. The *coccidia* are immersed in the substance of the frond, and prominent on both surfaces; on the upper surface there is a deep umbilicoid depression and a small pore. The cells of the frond are arranged in muriform order. The colour when recent is a brilliant purplish lake, reflecting prismatic hues, especially when seen through water. The substance contains much saline matter and mannite, which is apt to effloresce if the specimens have not been steeped in fresh water for some hours.

Tab. 44. HYMENENA FISSA. Fig. 1. A frond:—*the natural size.* 2. Small portion of surface, with *sori* between the nerves. 3. Tetraspore. 4. Section of the frond. 5. Portion of surface, with *coccidia.* 6. Section of a coccidium. 7. A spore:—*all more or less highly magnified.*

GENUS 5. NITOPHYLLUM, *Grev.*

(*Aglaiophyllum,* Mont.)

Frons membranacea, plana, vage fissa, ecostata, vel omnino enervis vel nervis indefinitis ramosis evanescentibus varie peragrata. *Coccidia* hemispherica, per frondem sparsa, sporas e filis articulatis fasciculatis ortas foventia. *Tetrasporæ* in soris definitis varie per frondem sparsis collectæ. Algæ *cosmopolitanæ*, roseæ vel purpureæ, raro siccitate fuscescentes, dichotomæ vel palmatim partitæ, nunc fronde sessili nunc breve stipitata.

1. NITOPHYLLUM venosum, *Harv.;* fronde (maxima) tenui rosea undato-crispata breviter stipitata palmatim vel dichotome laciniata, nervis latis crebris ramosis anastomosantibus undique peragrata, soris minimis coccidiisque per totam frondem dispersis.

Hab. Table Bay, Cape of Good Hope, *W. H. H.* (*v. v. et s. in Herb. T. C. D.*)

Frond with a very short stem, suddenly expanding into a membrane one or two feet long, and nearly as broad, traversed throughout by a multitude of closely placed, broad, branching, longitudinal nerves. The membrane is oblong, very thin, somewhat cuneate at base, and cloven into two or more principal lobes, which are either again forked, or somewhat palmate. The margin is every where undulated, and often curled. *Coccidia* numerous, scattered. *Sori* very minute, densely scattered over every part of the frond.

2. Nitophyllum multinerve, *Hook. fil. et Harv.*; fronde breviter stipitata elliptica vel ovata subintegerrima vel lobata, nervis pluribus parallelis distinctis dichotomis apicem versus frondis evanescentibus. *Hook. Fl. Ant.* p. 473.

Hab. Hermite Island, Cape Horn, and Falklands, *Dr. Hooker.* (*v. s. in Herb. T. C. D.*)

Frond shortly stipitate, 2-4 inches long, cut into many ribbon-like segments, traversed by numerous slender nerves.

3. Nitophyllum Smithii, *Hook. fil. et Harv.*; fronde stipitata flabelliformi lobata basi cuneata superne divisa et lacera, apicibus laciniarum obtusis, marginibus planis, colore rubro subfuscescente, nervosa, nervis gradatim evanescentibus basilari centrali crasso lateralibus radiantibus tenuibus nunc evanidis, soris minutis rotundatis margines versus laciniarum frondis densissime sparsis. *Hook. Fl. Ant.* vol. ii. p. 473. t. 178.

Hab. Falkland Islands, on the larger Algæ, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker*).

4. Nitophyllum (*Cryptopleura*) minor, *Sond.*; "fronde tenuissima lineari dichotoma integerrima, segmentis ultimis abbreviatis obtusis, soris fructiferis terminalibus rotundatis." *Sond. in Pl. Preiss.* vol. ii. p. 194.

Hab. Swan River, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

5. Nitophyllum affine, *Harv.*; fronde stipitata flabelliformi lacerata enervi basi incrassata, laciniis subpinnatifidis sinubus rotundatis, soris minutis oblongis in laciniis ultimis secus marginem dispositis. *Harv. in Lond. Journ.* vol. iii. p. 447.

Hab. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 5–6 inches long, about as wide, stipitate, cleft into numerous pinnatifid, nerveless segments. *Sori* minute, marginal. A species requiring further examination.

6. Nitophyllum punctatum, *Grev.*; fronde tenuissima basi abrupte expansa enervosa oblonga plus minus dichotoma, axillis rotundatis, soris magnis oblongis per totam frondem dispersis. *Harv. Phyc. Brit.* t. 202–203. &c.

Hab. Tasmania, *Mr. Gunn.* (*v. v. et s. in Herb. T. C. D.*)

The Tasmanian specimens are very similar to some British individuals of this very variable species.

7. NITOPHYLLUM Crozieri, *Hook. fil. et Harv.*; fronde basi longe cuneata in stipitem angustata lineari-lanceolata vel ovata vel late ovato-lanceolata integerrima vel in laciniis plurimis longitudinaliter fissa enervi tenerrima rosea, soris majusculis oblongis coccidiisque per frondem sparsi. *Hook. Fl. Antarct.* vol. ii. p. 473. t. 177.

HAB. Hermite Island, Cape Horn, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Allied to *N. punctatum*, from which it chiefly differs in form.

8. NITOPHYLLUM crispatum, *Hook. fil. et Harv.*; fronde basi nervosa cuneata latissime expansa vel oblonga dichotoma v. laciniata margine crispata, nervis ramosis, laciniis cuneatis apicibus axillisque obtusis, soris minutis rotundatis coccidiisque sparsis. *Hook. Fl. Ant.* vol. i. p. 185. t. 71. f. 1.

HAB. Campbell's Island, *Dr. Hooker.* (*v. s. in Herb. Hooker.*)

9. NITOPHYLLUM laciniatum, *Hook. fil. et Harv.*; fronde flabelliformi profunde digitatim lobata vel subdichotome pinnatifida, laciniis inciso-dentatis. *Hook. Fl. Ant.* vol. ii. p. 474.

HAB. Cape Horn and Falklands. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

A doubtful species, possibly only a variety of *N. Bonnemaisoni.* No full grown specimens seen.

10. NITOPHYLLUM fusco-rubrum, *Hook. fil. et Harv.*; stipite filiformi elongato nunc dichotome ramoso nudo, ramis frondiferis, frondibus flabelliformibus lobatis vel longitudinaliter fissis crasso-membranaceis fusco-rubris, basi cuneatis in stipitem gradatim angustatis tenuiter venosis, margine plano subintegerrimo, apicibus (exemplaribus nostris) laceris, soris minutissimis punctiformibus coccidiisque numerosissimis per totam frondem sparsis. *Hook. Fl. Ant.* vol. ii. p. 472.

HAB. Kerguelen's Land, rare, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

11. NITOPHYLLUM lividum, *Hook. fil. et Harv.*; fronde e stipite brevi filiformi cartilagineo late expansa tenerrima basi vix venosa furcata vel dichotoma margine undulata livido-purpurea, laciniis patentibus oblongis obtusis, soris minutissimis punctiformibus coccidiisque numerosis per totam frondem sparsis. *Hook. Fl. Ant.* vol. ii. p. 472. t. 179.

HAB. Falkland Islands, *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

A very remarkable and distinct species.

12. NITOPHYLLUM Gunnianum, *Harv.*; fusco-purpureum, siccitate fuscescens, fronde latissima basi crassiore stipitata avenia flabellatim fissa, laciniis lato-cuneatis plus minus furcatis incisisque, margine minute eroso-crispatulo, soris parvis punctiformibus densissime apicem versus sparsis. (TAB. XLVII.) *Hook. et Harv. in Lond. Journ.* vi. p. 403.

HAB. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Frond 8-12 inches or more in expansion, having a very short stipe, rapidly dissolving in the thickened but veinless base of the lamina. *Colour* when dry a deep brown. All the specimens I have seen are riddled with holes, as represented in the figure.

TAB. 47. NITOPHYLLUM GUNNIANUM. Fig. 1. Frond:—*the natural size.* 2. Small portion of surface, showing erose margin and large cells. 3. Section of the frond: —*both magnified.*

13. NITOPHYLLUM multipartitum, *Hook. fil. et Harv.;* fronde stipitata flabelliformi multipartita, laciniis angustis linearibus dichotomis obtusis, margine plano integro ciliatove, soris minutis punctiformibus densissime apicem versus sparsis. *Hook. et Harv. in Lond. Journ.* vol. vi. p. 404.

HAB. Tasmania, *Mr. Gunn, Dr. Hooker.* Port Philip, *Mr. Mallard.* (*v. s. in Herb. T. C. D. comm. cl. Hooker et Ward.*)

Frond very much divided and lacerated, of a dark brownish purple colour, narrow, often pierced with holes. Our specimens are imperfect.

GENUS 6. PLOCAMIUM, *Lamour.*

(*Plocamium.—Thamnophora,* Ag.—*Thamnocarpus,* Kg.)

Frons coccinea, linearis, compressa vel plana, ecostata vel costa tenui percursa, cellulosa, distiche ramosissima, ramulis alternis vel secundis subulatis. Fructus duplex:—1. *Coccidia* sessilia vel pedicellata, marginalia vel axillaria, intra pericarpium crassum massam sporarum foventia. 2. *Stichidia* simplicia vel sæpius ramosa, sparsa vel axillis aggregata, sporas zonatas biseriatas continentia. Algæ sæpissime *australes* (una specie cosmopolitana) pulcherrimæ, ramulis elegantissime pectinatis memorabiles, radice sæpissime fibrosa. Tetrasporæ oblongæ, zonatim partitæ.

SECTIO 1. THAMNOPHORA. *Frons* sæpius membranacea, plana, ecostata vel costa tenui percursa; ramuli alterne gemini. *Coccidia* et *stichidia* axillaria, sæpius aggregata.

1. PLOCAMIUM Corallorhiza, *Harv.;* fronde lato-lineari membranacea plana basi subcostata apici pinnatim vel bipinnatim ramosa, laciniis alterne geminis, inferiore dentiformi e basi latiori acuminata, superiore elongata laciniata, margine exteriori laciniarum serrato; coccidiis pedicellatis stichidiisque axillaribus densissime congestis.

THAMNOPHORA Corallorhiza, *Ag. Sp. Alg.* vol. i. p. 225. &c.

HAB. Cape of Good Hope. (*v. v. et s. in Herb. T. C. D.*)

Root much branched. *Frond* 12-18 inches long, nearly half an inch broad, stipitate, branched above in a pinnate or bipinnate manner, the laciniæ first two at one side of the branch, and then two at the other side, the lowermost lacinia short and toothlike, the uppermost of the pair virgate, long and inciso-dentate or pinnatifid in a similar alterne-geminate manner. The outer edge of each lacinia is sharply but finely serrate. *Colour* a fine clear red.

2. **Plocamium** costatum, *Harv.;* fronde angusta membranacea plana costa plus minus incrassata percursa decomposite pinnata, laciniis alterne geminis, inferiore dentiforme deltoideo-subulata, superiore elongata laciniata, margine exteriori laciniarum serrato; stichidiis axillaribus pluries furcatis densissime congestis.

Thamnophora costata, *J. Ag. Linn.* vol. xv. p. 10.

Thamnophora Cunninghamii, *Grev. in Hook. Comp. Bot. Mag.* 2, p. 329.

Plocamium Preissianum, *Sond. Pl. Preiss.* vol. 2, p. 192.

Hab. Shores of Australia and New Zealand, common. (*v. s. in Herb. T. C. D.*)

Frond 6-8 inches long, one or two lines in breadth, traversed by a more or less evident, thickened midrib, much branched: the laciniæ long and virgate. The ramuli narrow and deltoid or subulate, somewhat falcate, the outer edge curved and distinctly serrated.

A common plant variable in many characters, but always recognisable by the serrated ramuli and thickened midrib.

3. **Plocamium** Mertensii, *Grev.;* fronde elata latiuscula membranacea plana subecostata (costa obsoleta) decomposite pinnata, laciniis alterne geminis, inferiore nunc dentiformi lineari-subulata nunc multifida laciniis subulatis, superiore elongata laciniata, margine exteriore laciniarum apicem versus denticulato; stichidiis axillaribus hamatis congestis.

Hab. Southern and Western Shores of Australia, *Frazer, Preiss,* &c. (*v. s. in Herb. T. C. D. comm. cl. Greville, &c.*)

A beautiful species 1-2 feet long, two or three lines in breadth, of a delicately membranous substance and rosy colour. The ramification is the same as in the preceding species, but here the ramuli are very narrow, longer, sometimes multifid, and serrated at the points only; and the stichidia are unbranched.

4. **Plocamium** procerum, *Ag.;* fronde lato-lineari membranacea plana subecostata (costa obsoleta) decomposite pinnata, laciniis alterne geminis, inferiore dentiformi lineari subulata, superiore elongata laciniata, margine exteriore laciniarum integerrimo; coccidiis axillaribus solitariis.

Thamnophora procera, *J. Ag. in Linn.* vol. xv. p. 10.

Hab. Shores of Australia and Tasmania. (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Very nearly related to the preceding, and chiefly distinguished by the perfectly entire outer edge of the ramuli. This character, is, I fear, hardly sufficiently constant in either species to be relied on as absolute.

5. **Plocamium** angustum, *J. Ag.;* fronde angusta cartilagineo-membranacea costa valida percursa decomposite pinnata, laciniis alterne geminis, inferiore dentiformi leneari-subulata, superiore elongata sæpius virgata laciniata, margine exteriore laciniarum integerrimo; coccidiis solitariis stichidiisque congestis axillaribus.

Thamnophora angusta, *J. Ag. Linn.* xv. p. 10, &c.

Hab. Shores of Australia and Tasmania. Common. (*v. s. in Herb. T. C. D.*)

Distinguished by its narrow ribbed fronds and very entire, subulate ramuli.

6. **Plocamium** pusillum, *Sond.;* " fronde tenerrima subcompressa bi-tripinnata, pinnis pinnulisque alterne geminis subulatis rectis vel subincurvis." *Sond. Pl. Preiss.* vol. ii. p. 192.

Hab. Swan River, *Preiss.* (*v. s. in Herb. T. C. D. comm. cl. Binder.*)

7. **Plocamium** cornutum, *Harv.;* fronde angusta cartilaginea tereti-compressa vage ramosa laciniata, laciniis alterne geminis, inferiori lineari subulata integerrima, superiori nunc brevi multifida nunc elongata laciniata vel pinnatim ramosa; stichidiis axillaribus congestis.

Thamnophora cornuta, *Grev. Alg. Brit. Syn.* p. xlix.

Thamnocarpus cornutus, *Kütz.*

Hab. Cape of Good Hope. (*v. v. et s. in Herb. T. C. D.*)

Root very much branched, resembling that of *P. corallorhiza*. *Frond* 2-6 inches high, simple or slightly branched, the branches few and virgate, terete below, compressed above, of cartilaginous substance and dull colour. The fructification is exactly similar to that of others of the genus.

8. **Plocamium** abnorme, *Hook. fil. et Harv.;* fronde angusta tenui nervo obsoleto percursa pinnatim decomposita virgata, pinnis pinnulisque alterne geminis sensim angustatis, ultimis angustissimis, ramulis subulatis integerrimis acutis, stichidiis axillaribus subsolitariis simplicibus furcatisve lanceolatis, nonnunquam ex pinnulis ipsis ultimis transmutatis formatis. *Hook. et Harv. in Lond. Journ.* vol. iv. p. 543. (**Tab.** XLIII.)

Hab. Bay of Islands, New Zealand, *Cunningham, Lyall, Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Greville; cl. Hooker.*)

Nearly related to *P. angustum*, but differing in fructification.

Tab. 43. **Plocamium abnorme.** Fig. 1. Frond :—*the natural size.* 2. Portion of a branch. 3. A stichidium. 4. Apex of a branch with imbedded tetraspores :—*all magnified.*

Sectio 2. **Eu-Plocamium.** *Frons* cartilaginea plano-compressa, ecostata; ramuli alterne terni quaternive. *Coccidia* et stichidia sparsa, ad ramos lateralia.

9. **Plocamium** coccineum, *Lyngb.;* fronde angusta cartilaginea plano-compressa ramosissima, ramis subalternis patentibus, ramulis subulatis secundis ternis vel quaternis pectinatis; coccidiis sessilibus solitariis stichidiisque ramosis sparsis. *Harv. Phyc. Brit.* t. 44, &c.

Hab. Cape Horn, Auckland Island, New Zealand, Tasmania, Australia, and the Cape of Good Hope. (*v. v. and s. in Herb. T. C. D.*)

Common to the northern and southern hemisphere.

10. Plocamium coccineum, var. flexuosum, *Hook. fil. et Harv.*; fronde valde flexuosa subdichotoma fulcris hamatis hic illic instructa, ramis elongatis, ramulis angustissimis fere capillaribus. *H. et H. in Lond. Journ.* vol. vi. p. 404. (Tab. XLIII.)

Hab. Tasmania, *Mr. Gunn.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

I hardly know whether to call this plant a very remarkable form of *P. coccineum*, or to admit it to specific rank. It is at least well worthy of being recorded and figured.

Tab. 43. Plocamium flexuosum. Fig. 1. Frond:—*the natural size.* 2. A small portion:—*magnified.*

11. Plocamium Hookeri, *Harv.*; fronde cartilaginea anguste lineari compressa plana distiche decomposite ramosa, ramis primariis subdichotomis patentibus, secundariis alternis flexuosis folia ramulosque alterne gerentibus, foliis planis aveniis oblique obovato-lanceolatis obtusis basi angustatis cultratis integerrimis vel margine exteriore crenatis, ramulis linearibus alterne et secunde pectinato-multifidis, stichidiis brevibus lateralibus dense fasciculatis digitatis laciniatis simplicibus obtusis, coccidiis lateralibus sessilibus sparsis. *Harv. in Lond. Journ.* vol. iv. p. 257. *Hook. Fl. Ant.* ii. p. 474. (Tab. XLII.)

Hab. Kerguelen's Land, *Dr. Joseph Dalton Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Inv.*)

A very remarkable plant, which I have peculiar gratification in distinguishing by the name of its acute discoverer.

Tab. 42. Plocamium Hookeri. Fig. 1. Frond:—*the natural size.* 2. Part of a branch, bearing stichidia. 3. One of the stichidia. 4. A tetraspore. 5. Part of a branch, with coccidia. 6. Section of a coccidium. 7. Spores from the same:—*all magnified.*

Sectio 3. Ptilonia. *Frons* basi cartilaginea, apice membranacea, plana, ecostata; ramuli alterni v. subopposití. *Coccidia* pedicellata sparsa: *stichidia* ignota.

12. Plocamium (?) Magellanicum, *Harv.*; fronde latiuscula basi cartilaginea costata, costa valida, apice membranacea decomposito-pinnatifida, ramis alternis, ramulis ultimis subulatis acutis serratis alternis sub-oppositisve; coccidiis sparsis sæpissime pedicellatis.

Thamnophora Magellanica, *Mont. Pol. Sud. Bot.* p. 162. t. 8. f. 2.

Hab. Port Famine, *Jacquinot.* Hermite Island, Cape Horn, the Falklands, and Kerguelen's Land; very abundant; *Dr. Hooker.* (*v. s. in Herb. T. C. D. comm. cl. Hooker.*)

Until the tetrasporic fruit shall be discovered, it is perhaps premature to decide whether this species be referrable to the present genus or not. It differs remarkably from all the other species in having its ramuli simply alternate, not alternate in pairs or in fours.

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[illegible]

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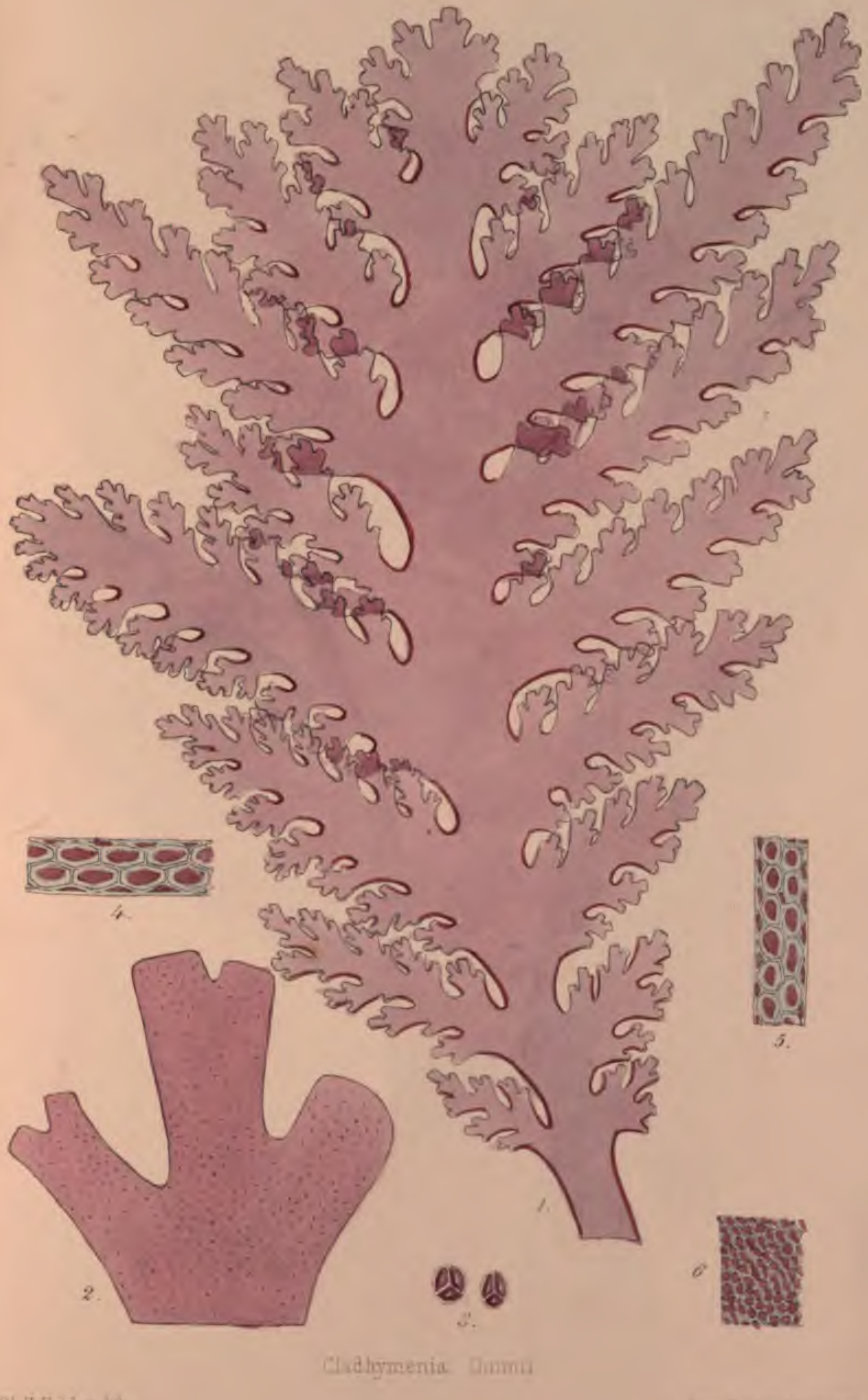
Tab. XXVII

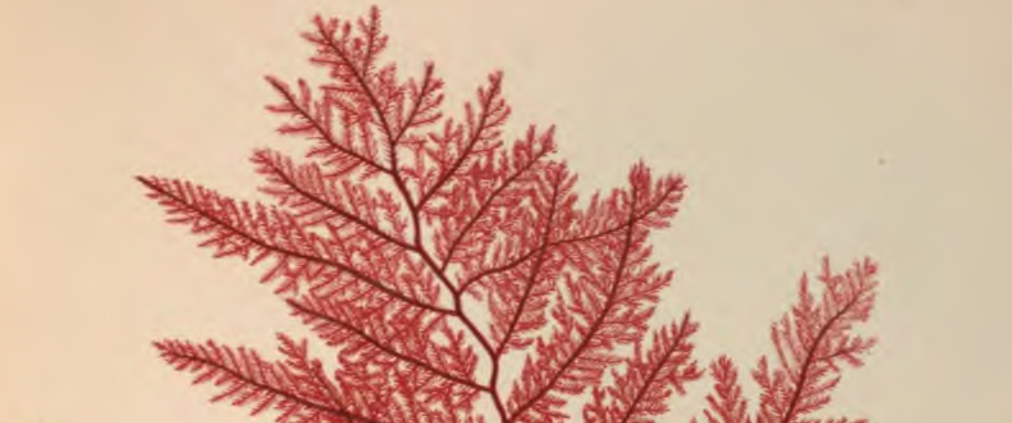


Cladhymenia Lyallii

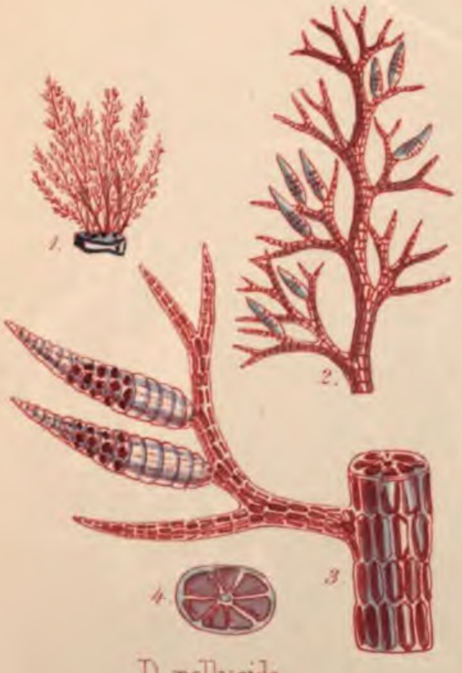
W. H. H. del. et lith.

Reeve, Benham & Reeve, imp.

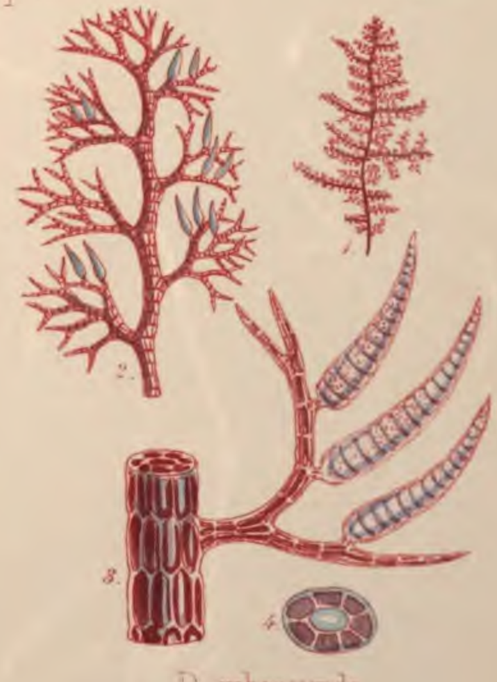
Tab. XXVII.



Dasya pectinata.



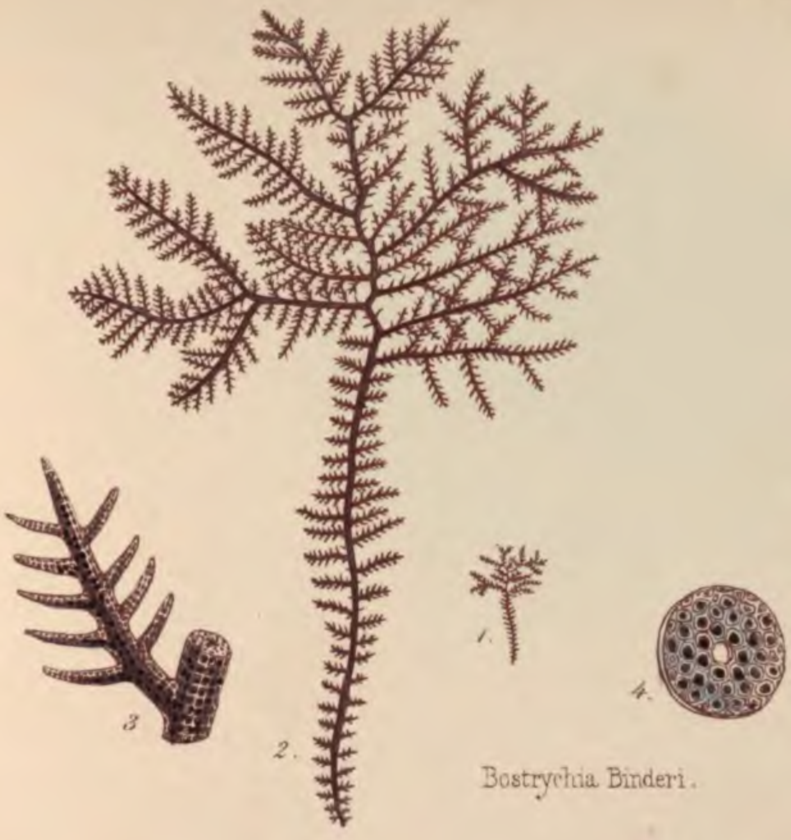
D. pellucida.



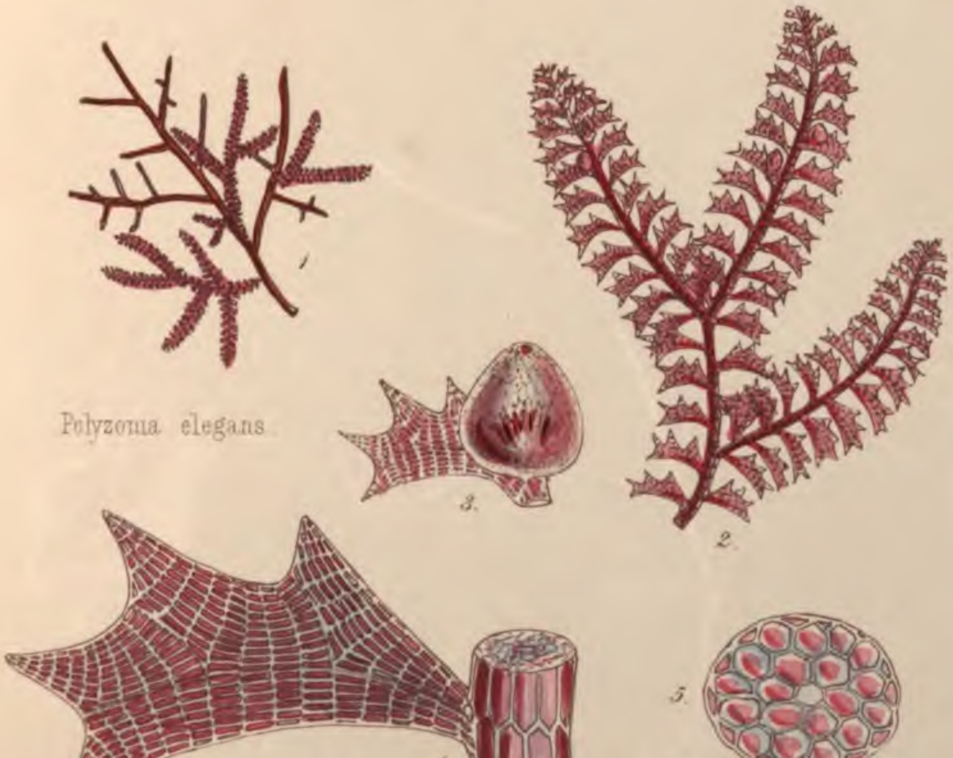
D. subsecunda.

W.H.H. del. et lith.

R.B.& R. imp.



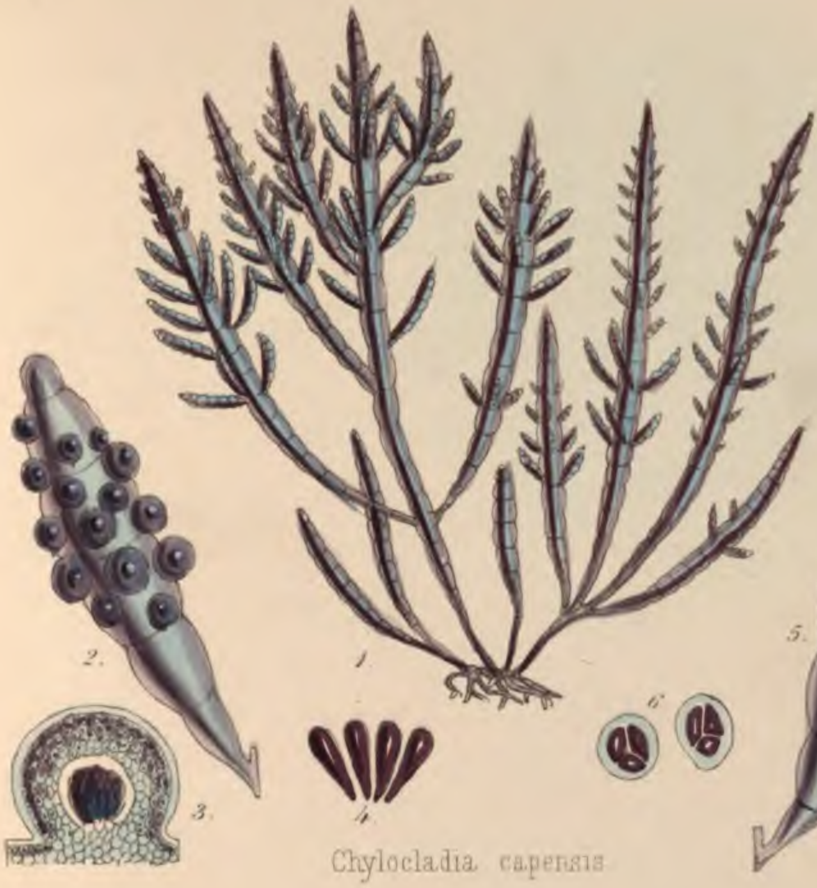
Bostrychia Binderi.



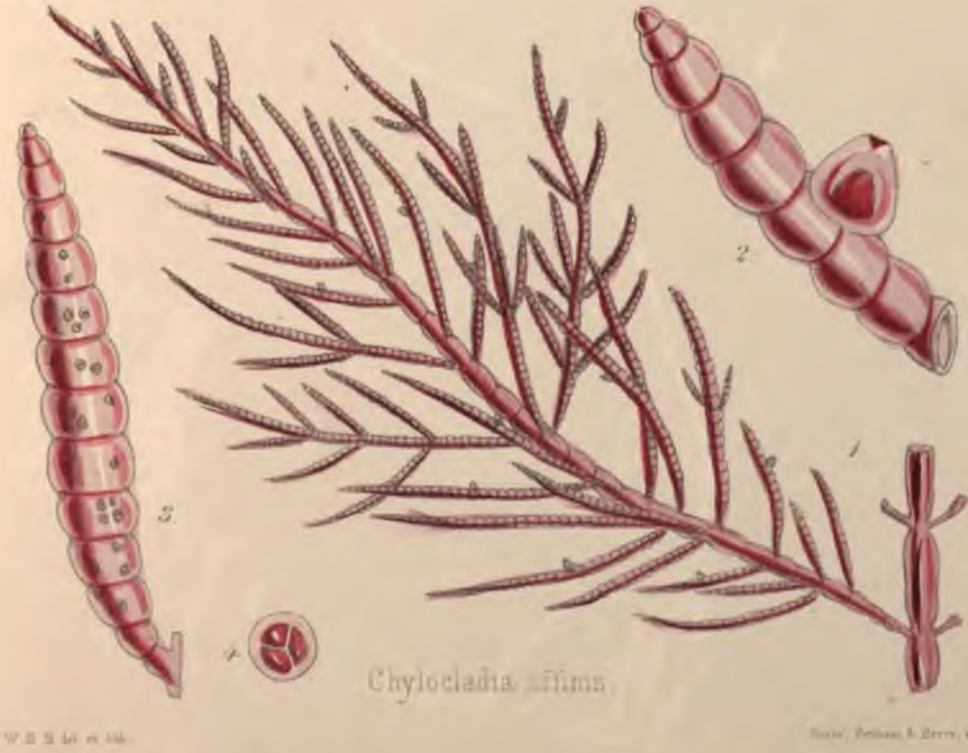
Polyzonia elegans.

W. H. H. del. et lith.

Reeve, Benham & Reeve imp.



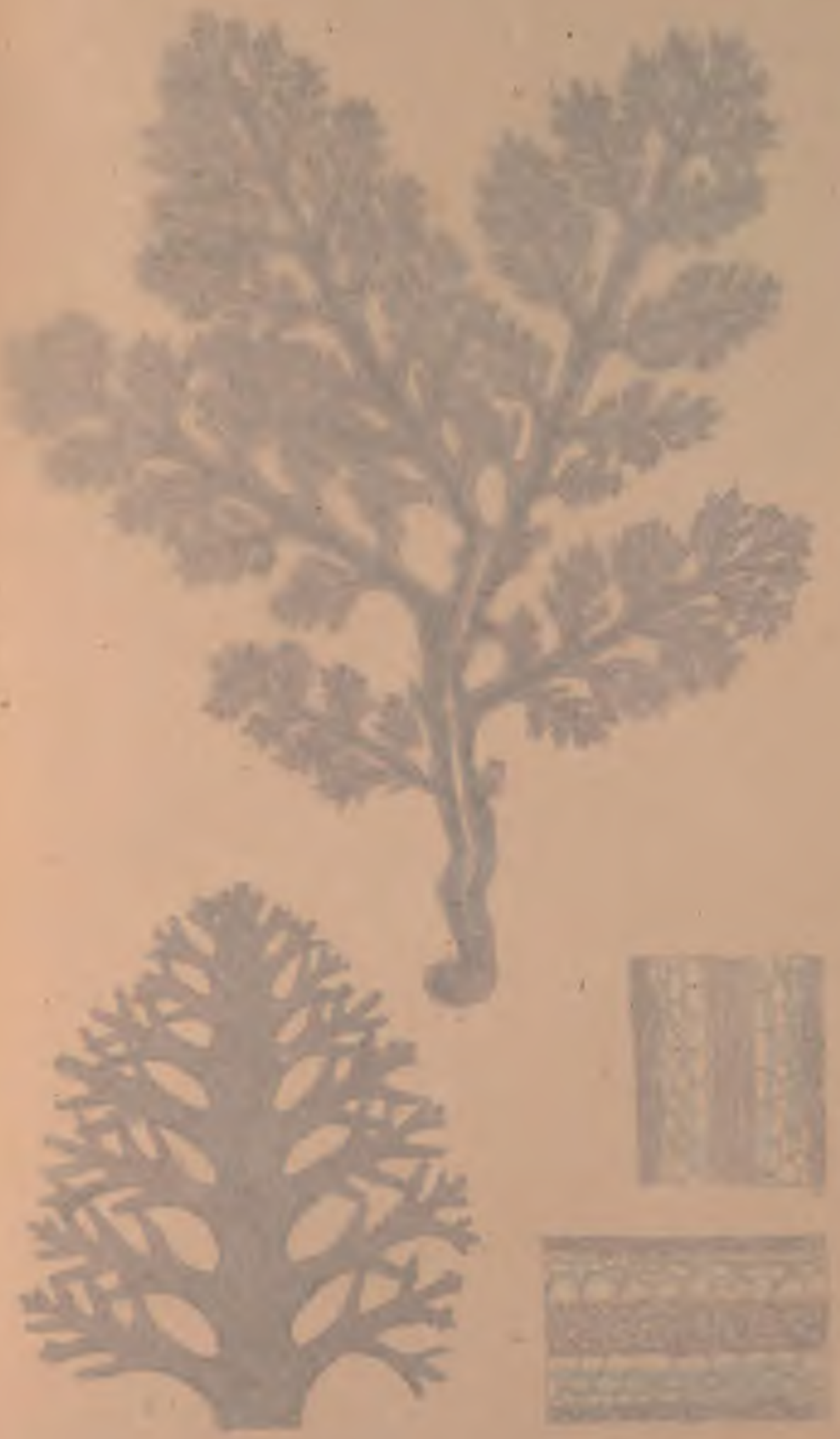
Chylocladia capensis



Chylocladia affinis

W. H. H. del. et lith.

Reeve, Benham & Reeve, imp.



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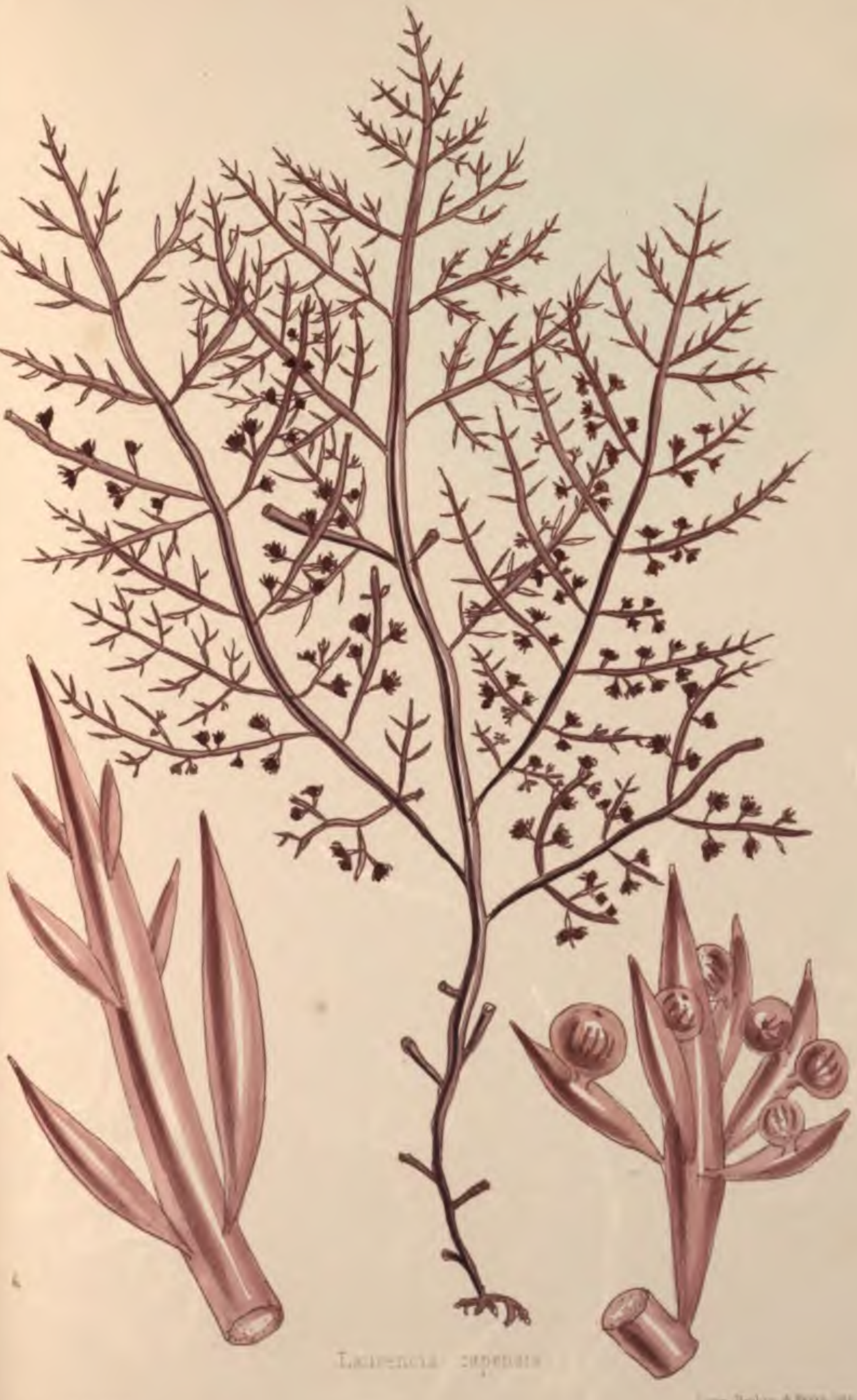
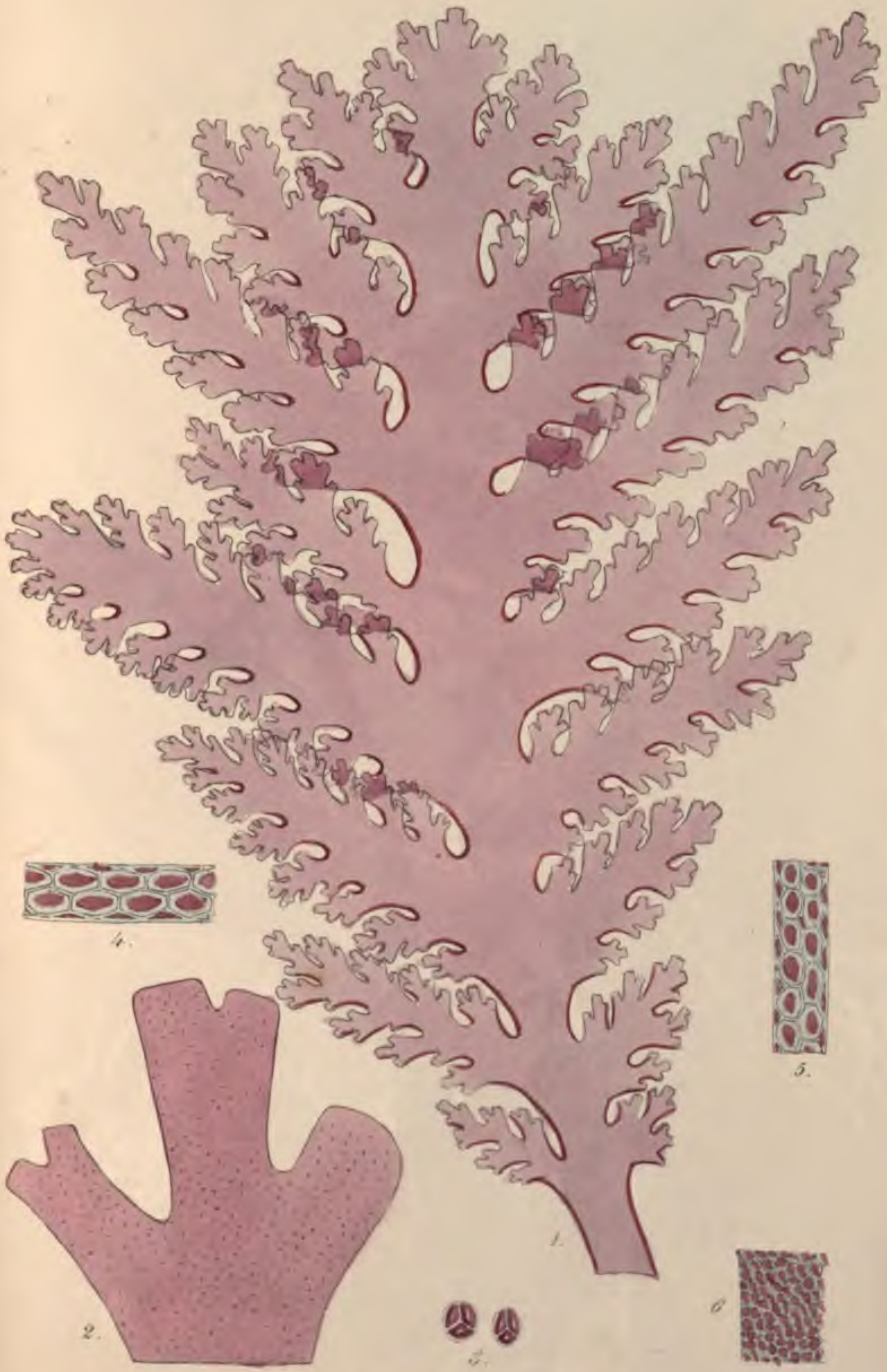
Tab. XXXI.



Laurencia capensis.

W. H. H. del. et lith.

Reeve, Benham & Reeve, imp.

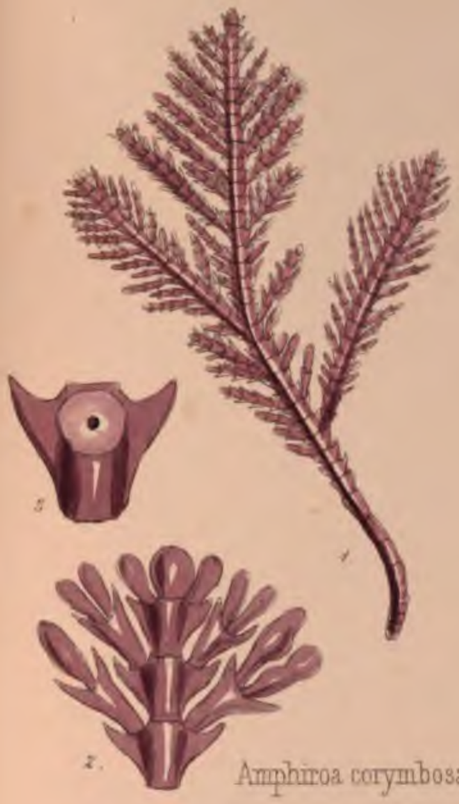


Cladhymenia Gunnii

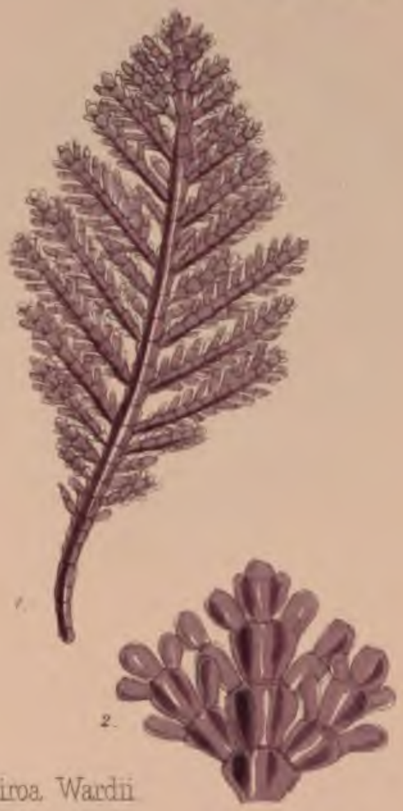
W. H. H. del. et lith.

Reeve Benham & Reeve, imp.

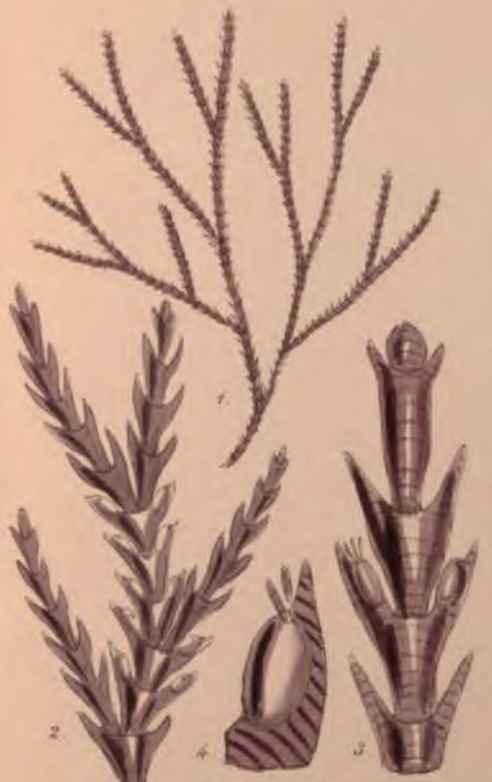
Tab. XXXVIII.



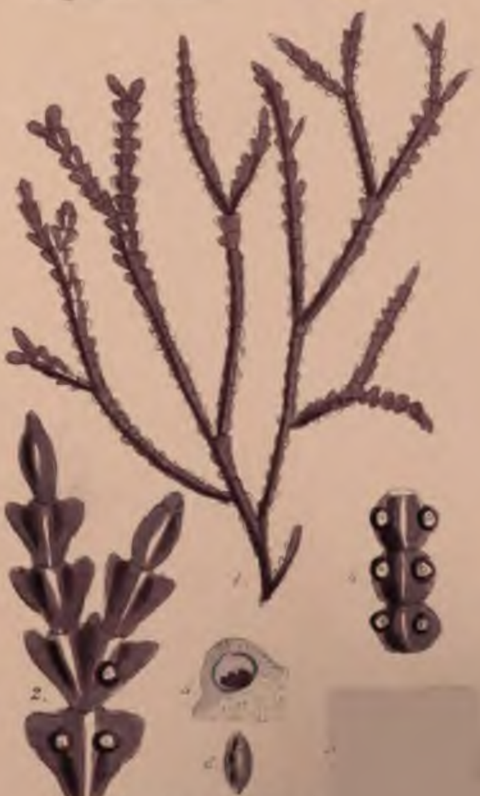
Amphiroa corymbosa.



Amphiroa Wardii



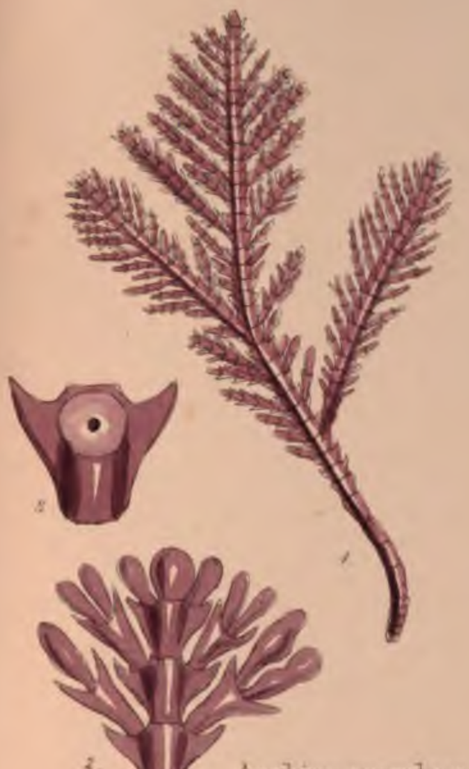
Amphiroa elegans.



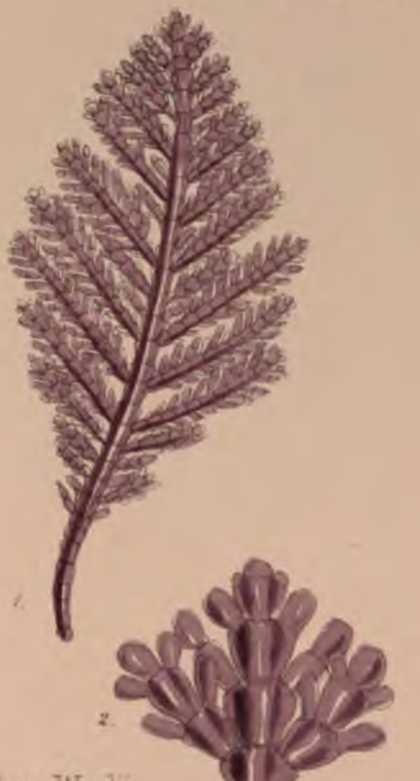
Amphiroa Orbigniana

W.H.H. del et lith.

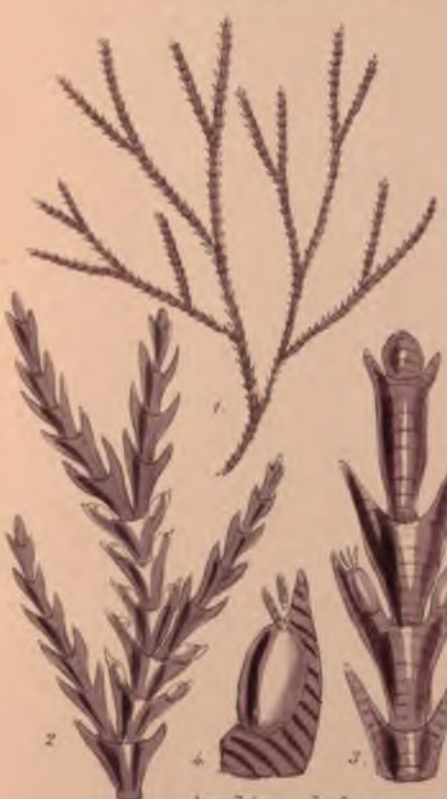
R



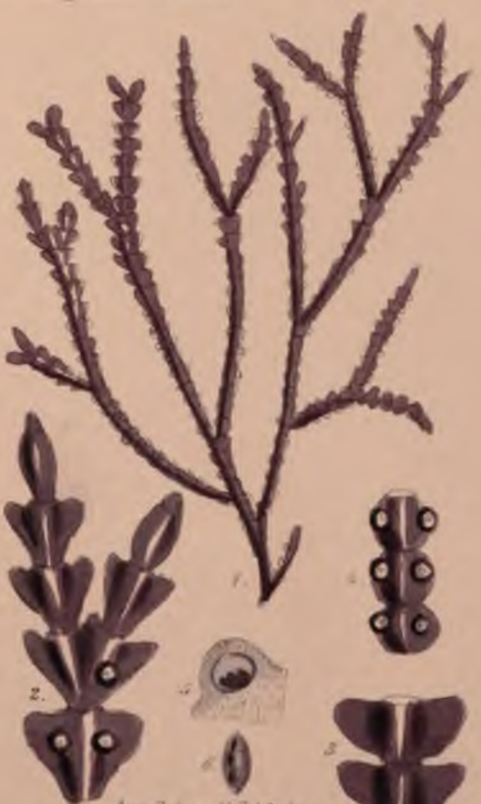
Amphiroa corymbosa



Amphiroa Wardii



Amphiroa elegans.

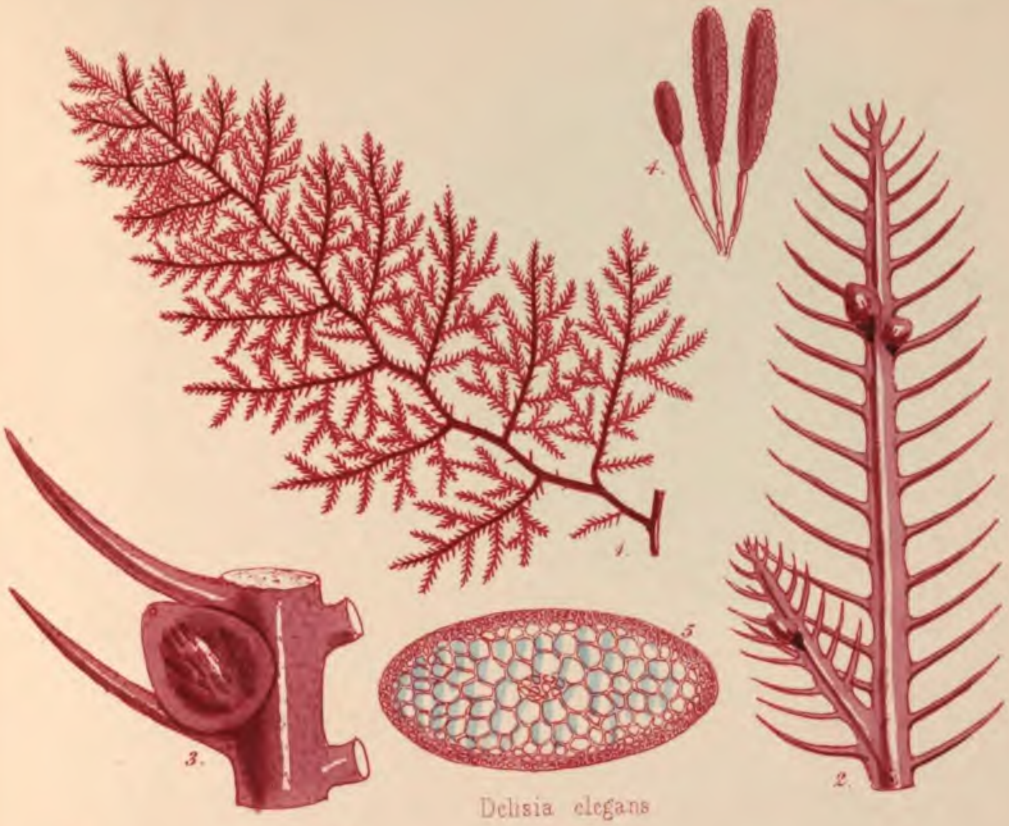


Amphiroa Orbigniana

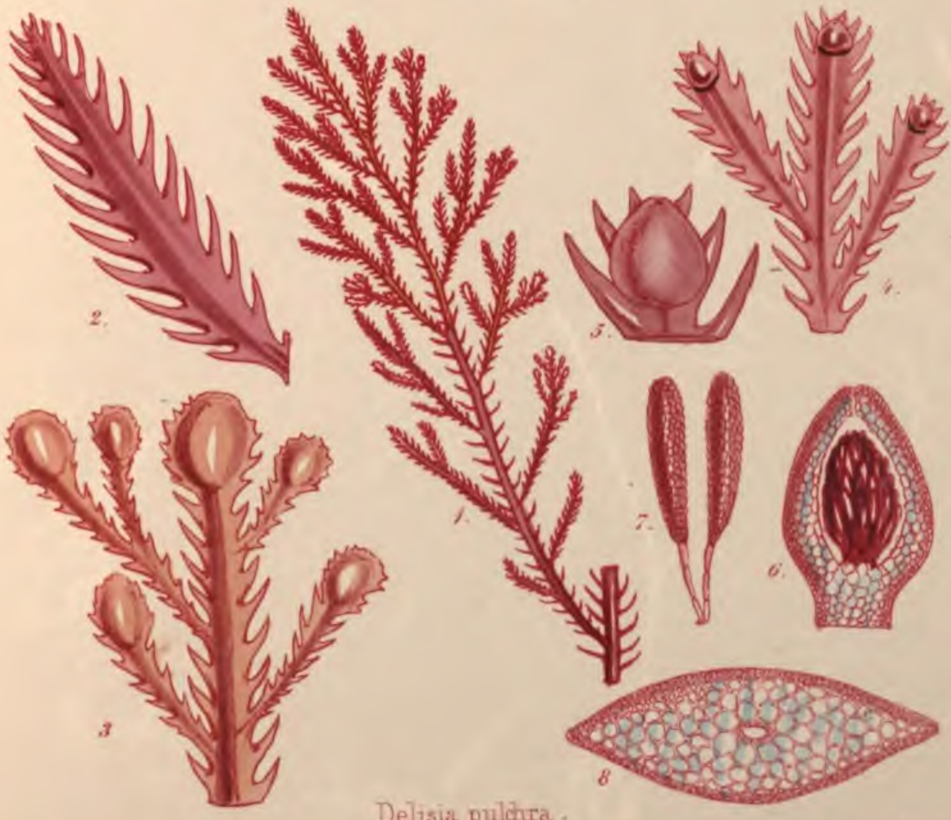
W.H.H. del et lith.

R.B. & R. imp.

Tab. XXXIV.



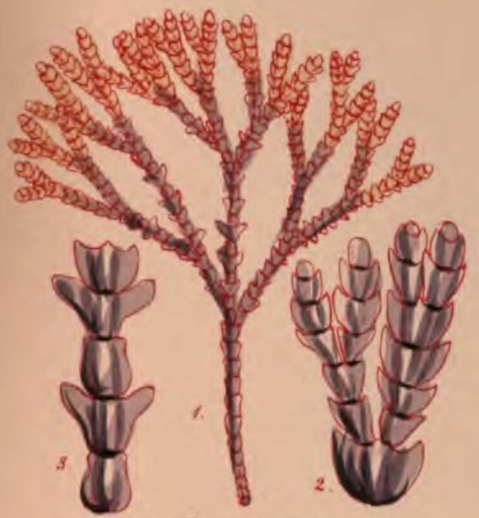
Delisia elegans



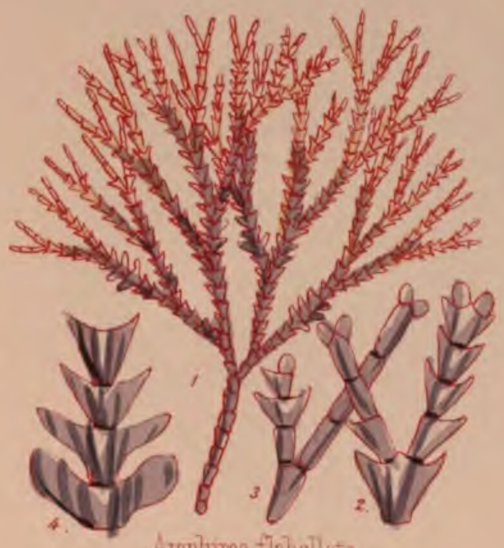
Delisia pulchra.

W. H. H. del. et lith.
Reeve, Benham & Reeve imp.

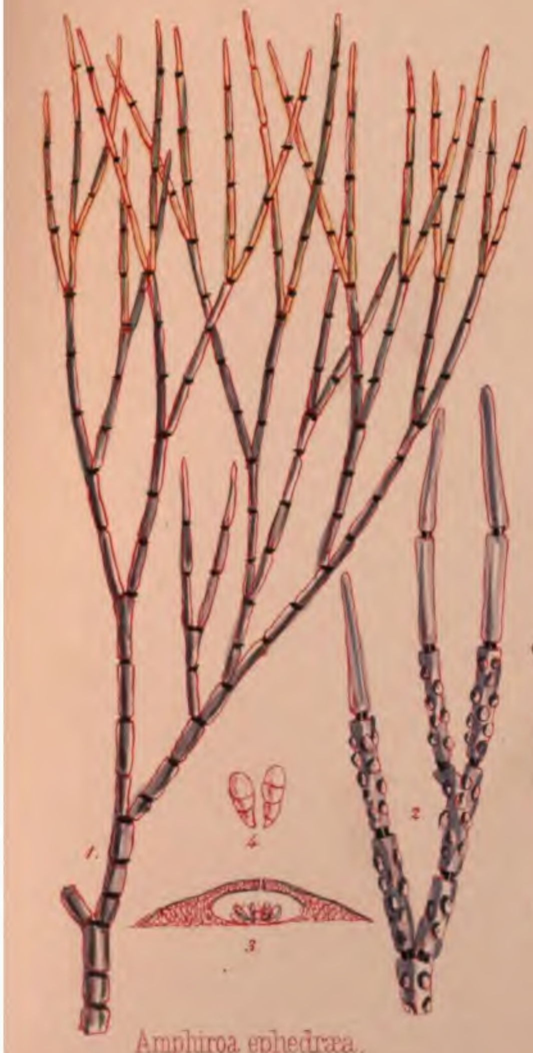
Tab. XXXIX.



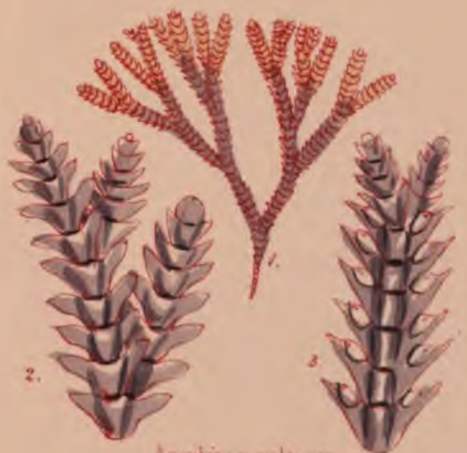
Amphiroa Stangeri



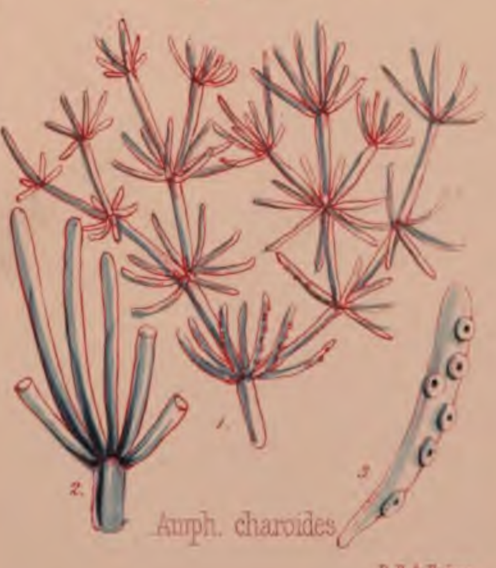
Amphiroa flabellata.



Amphiroa ephedræa.



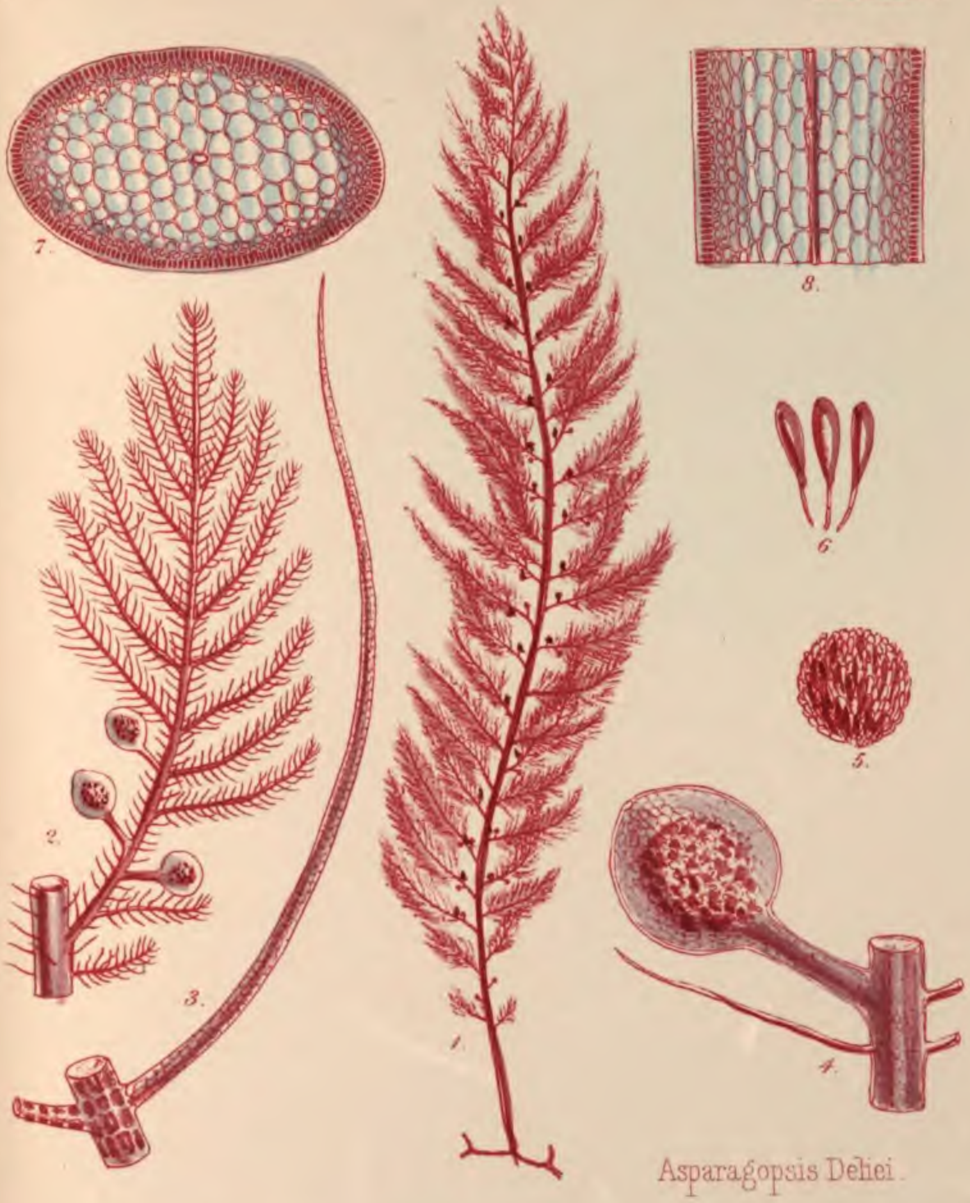
Amphiroa cultrata.



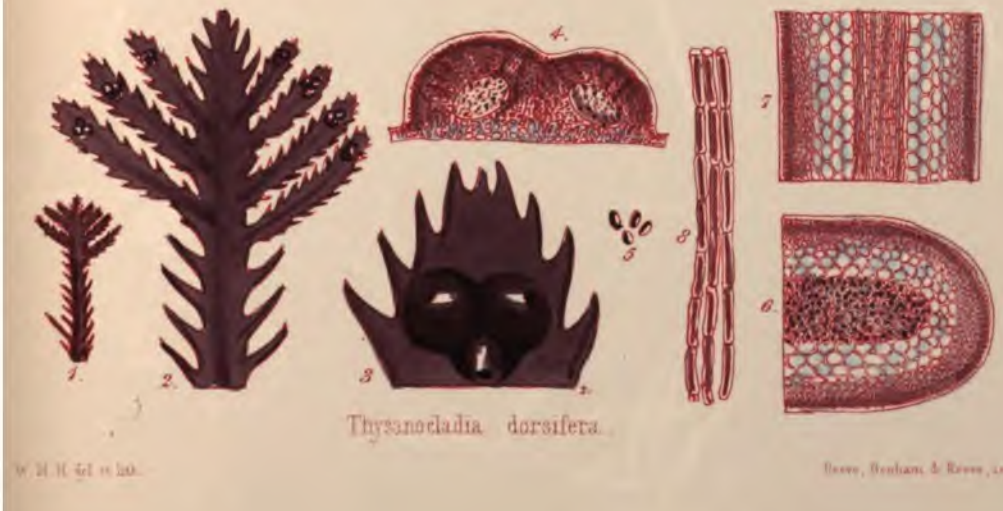
Amph. charoides

W.H.H. del et lith.

R.B.&R. imp.



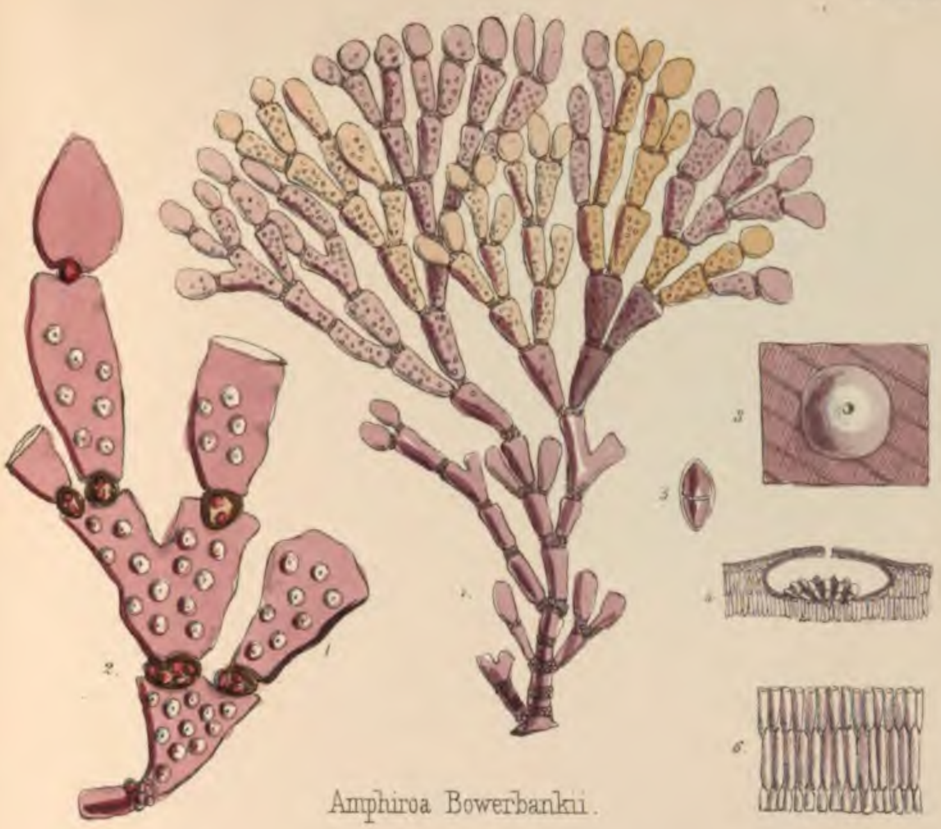
Asparagopsis Dehei.



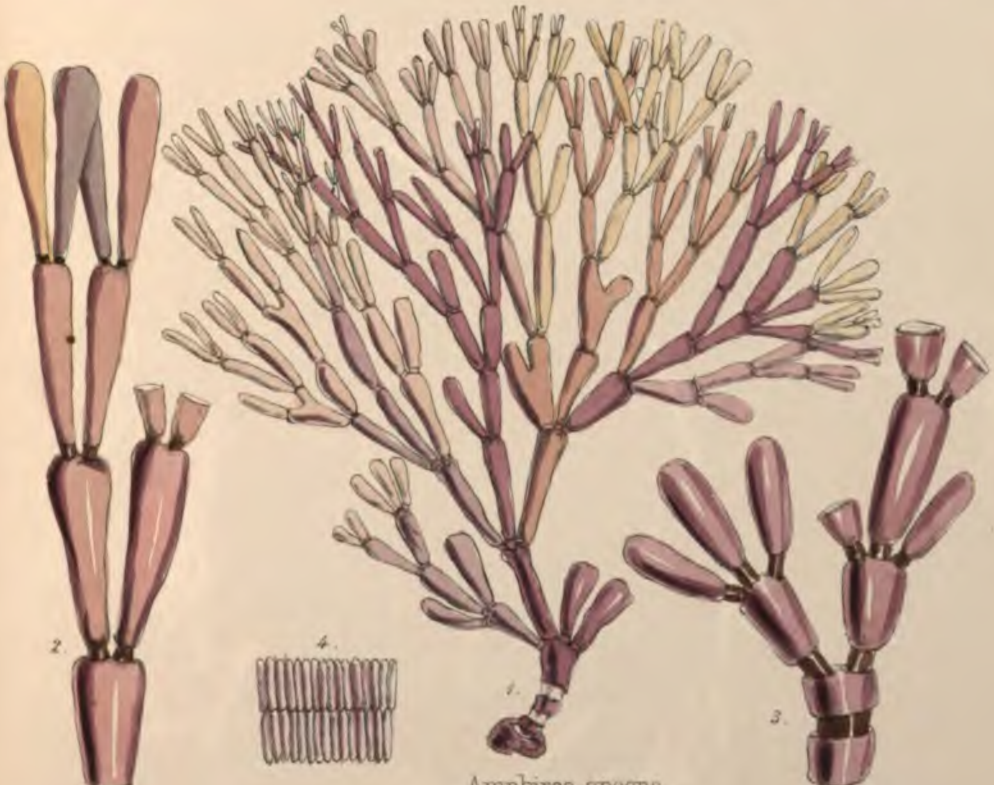
Thysanocladia dorsifera.

W. H. H. del et lith.

Reeve, Benham & Reeve, imp.



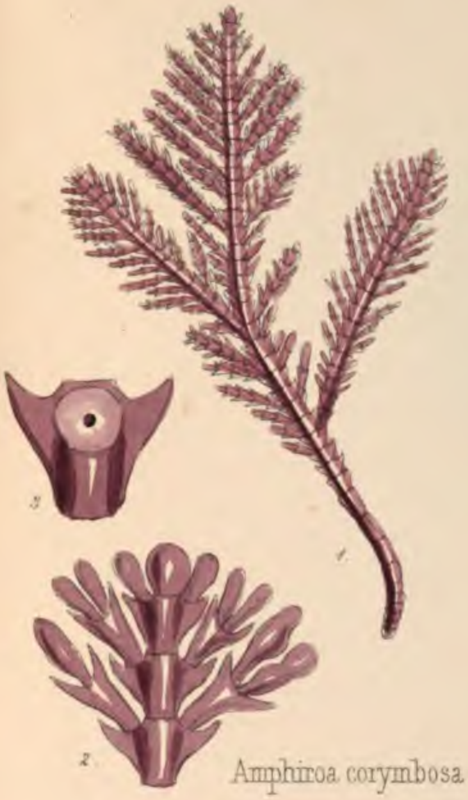
Amphiroa Bowerbankii.



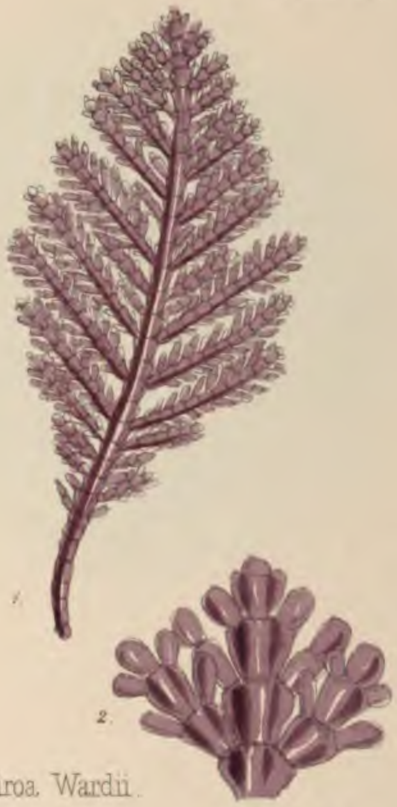
Amphiroa anceps.

W.H.H. del. et lith.
R.B.&R. imp.

Tab. XXXVIII.

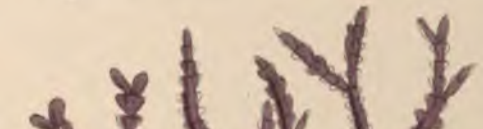


Amphiroa corymbosa.



Amphiroa Wardii.

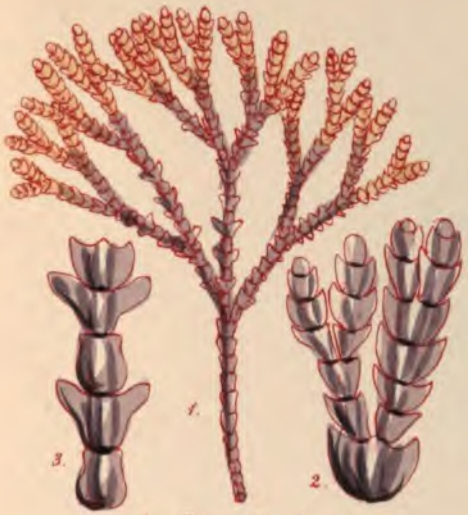
Amphiroa elegans.



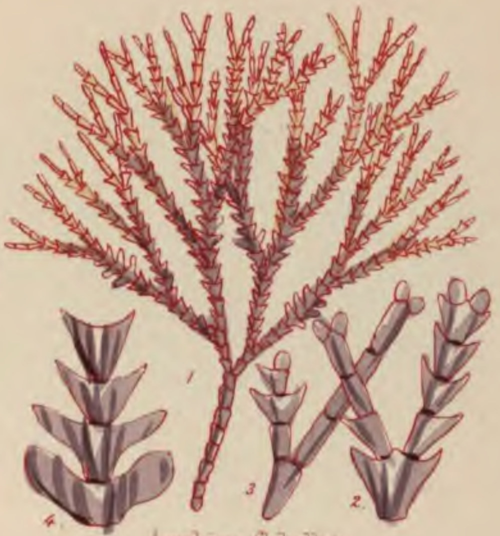
Amphiroa Orbigniana.

W.H.H. del et lith.

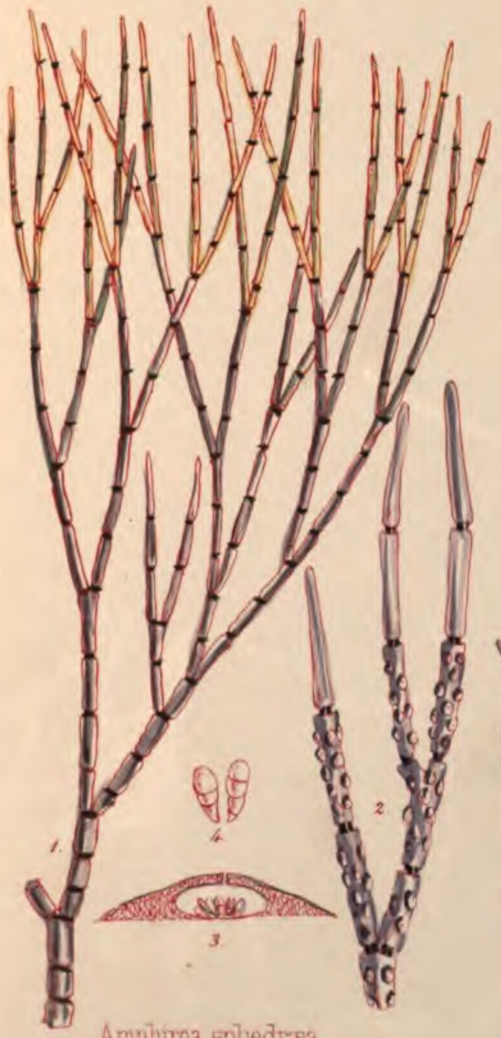
R.B. & R. imp.



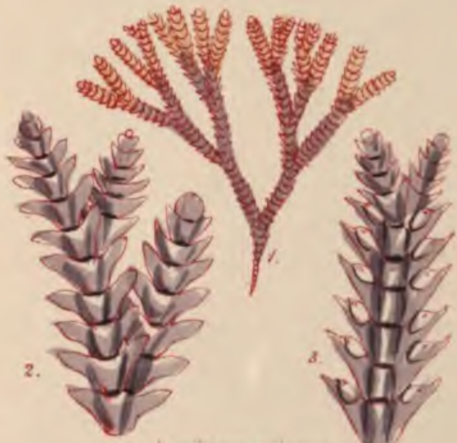
Amphiroa Stangeri.



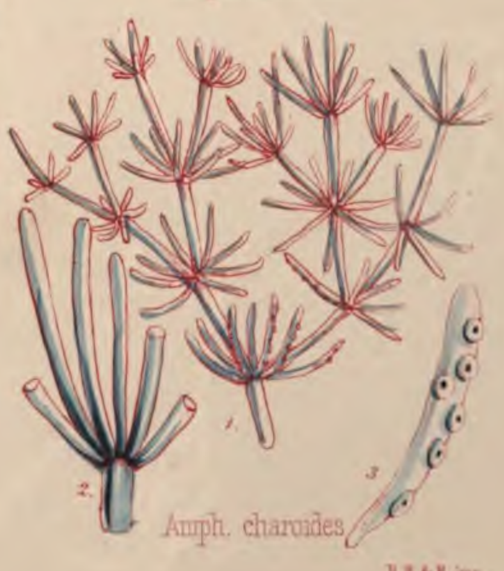
Amphiroa flabellata.



Amphiroa ephedræa.



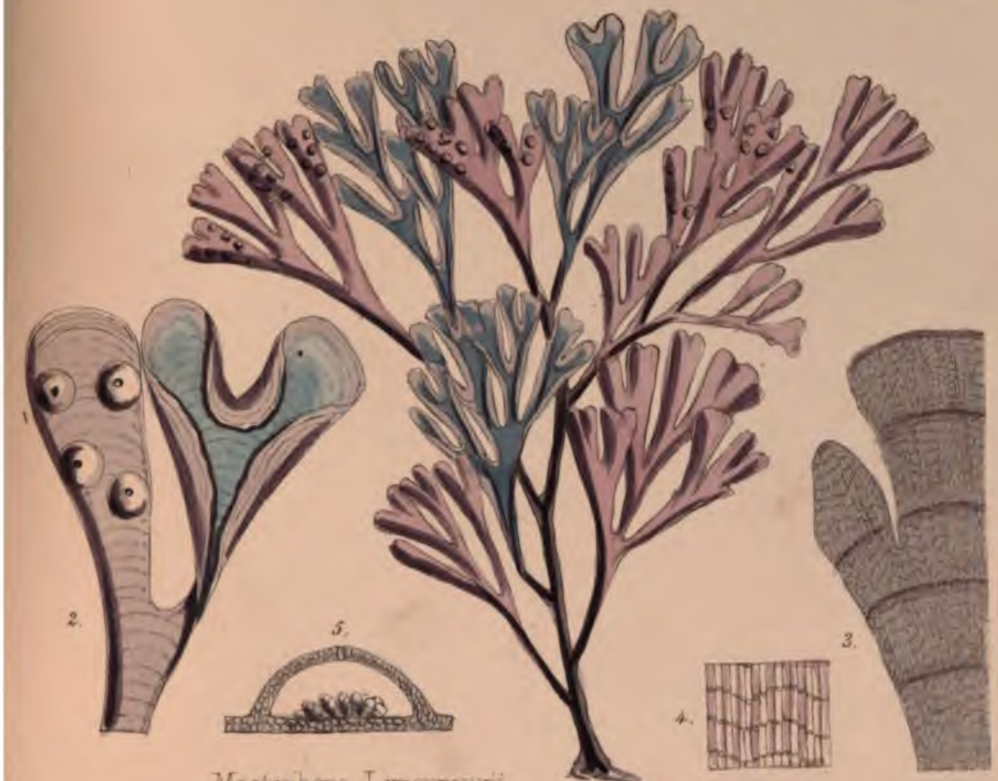
Amphiroa cultrata.



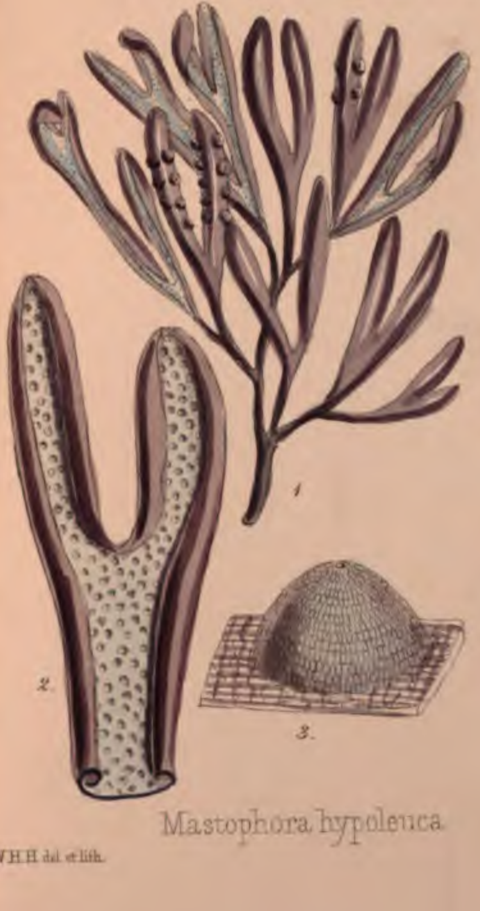
Amph. charoides.

W.H.H. del et lith.

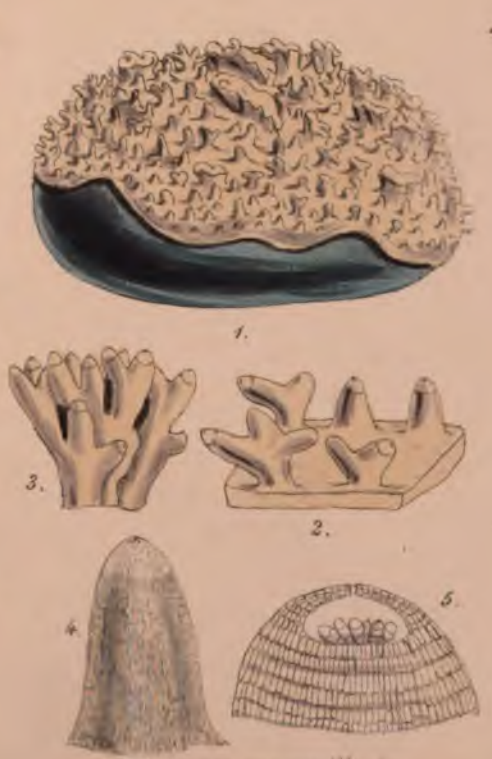
R.B. & R. imp.



Mastophora Lamourouxii



Mastophora hypoleuca

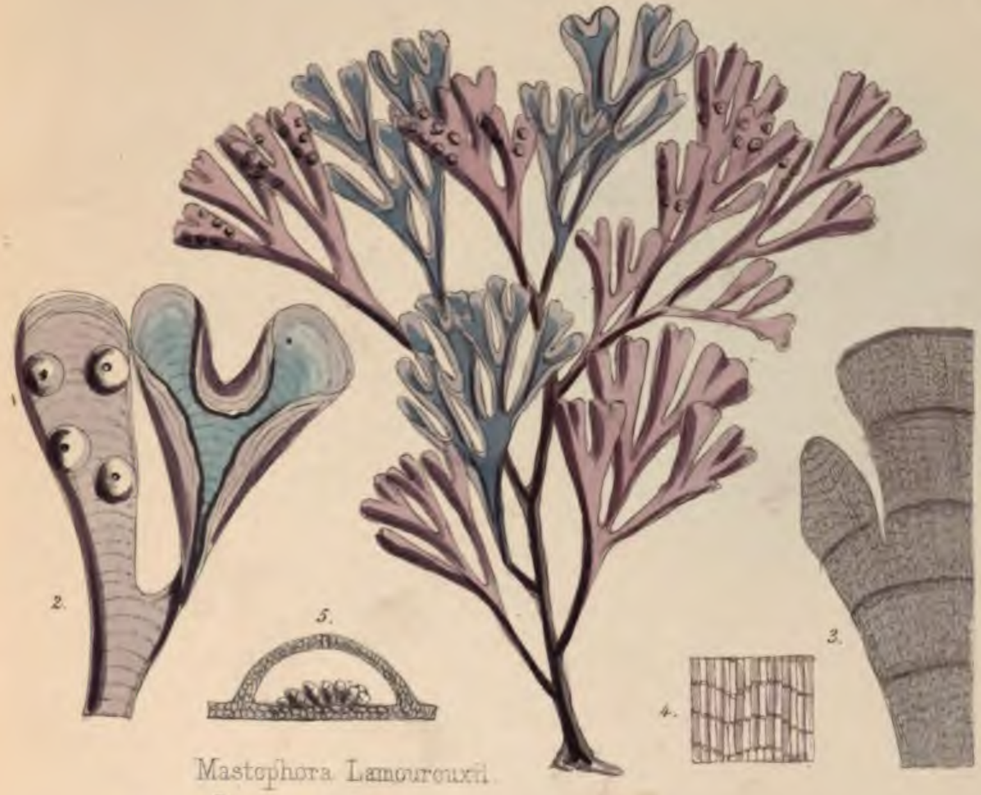


Melobesia mammillaris

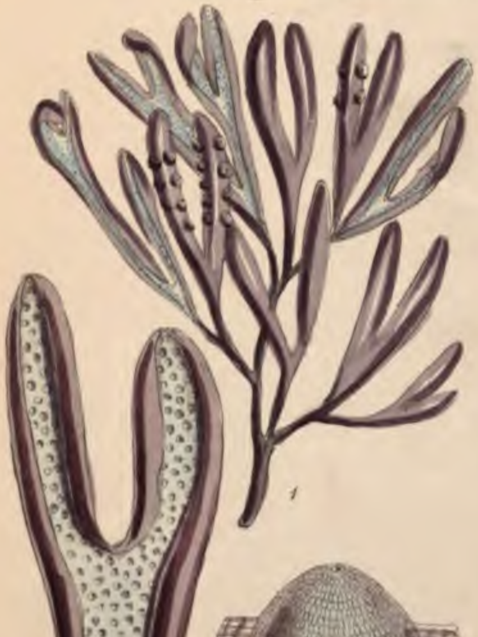
W.H.H. del. et lith.

R. B. & R. imp.

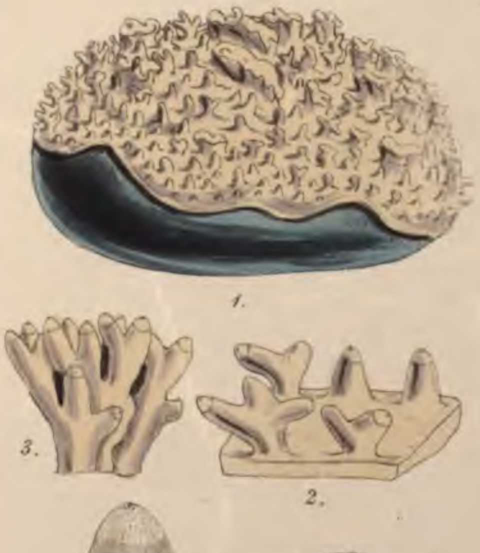
Tab XLI.



Mastophora Lamourouxii



Mastophora hypoleuca

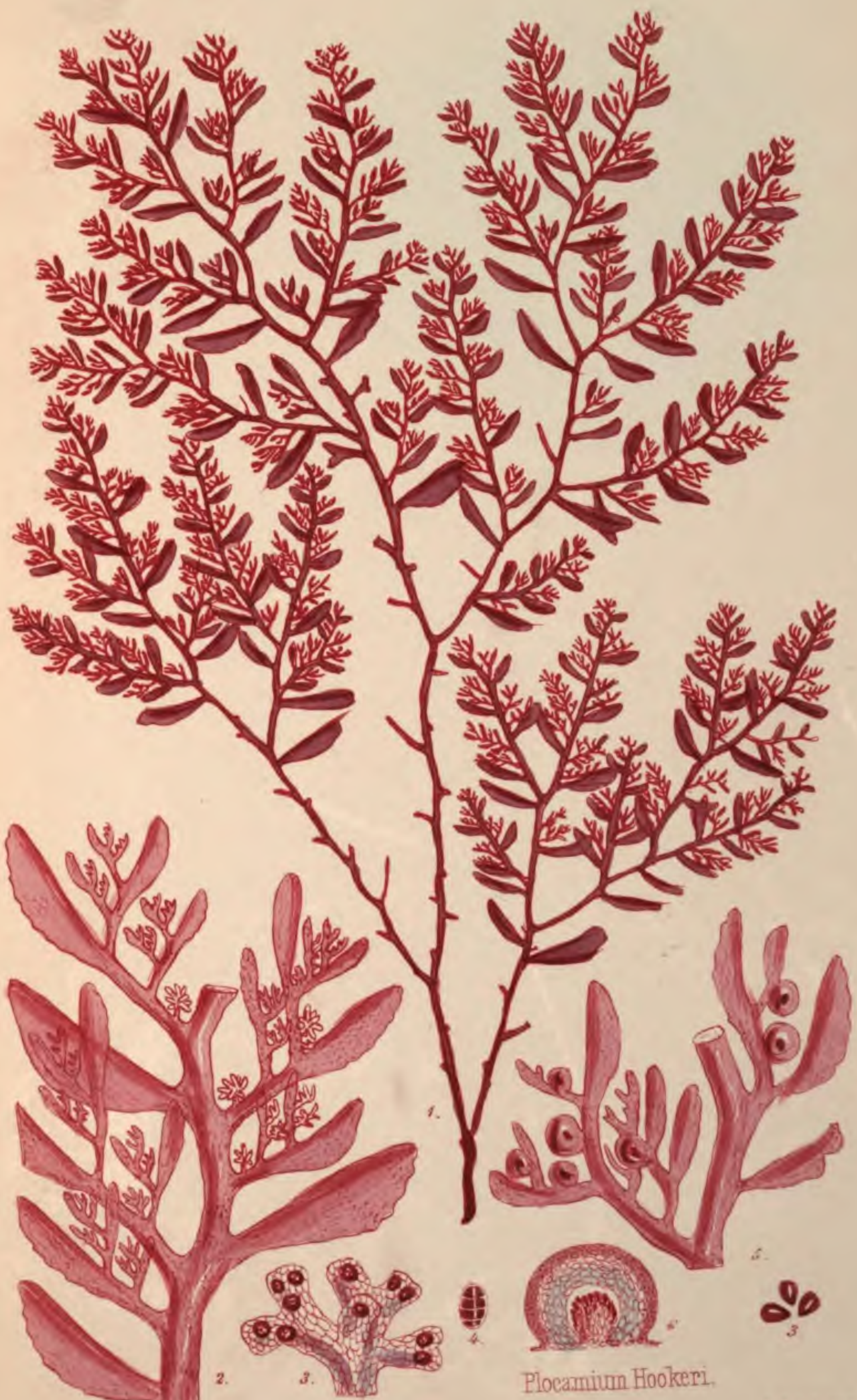


Melobesia mammillaris

W.H.H. del et lith.

R. B. & R. imp.

Tab. XLII.

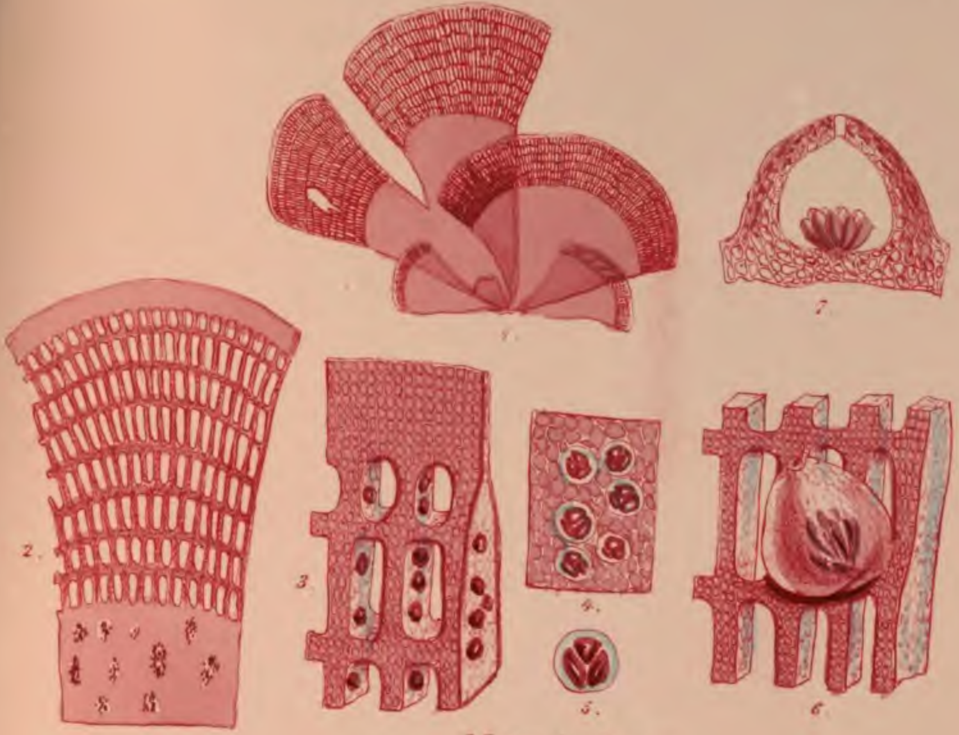


Plocamium Hookeri.

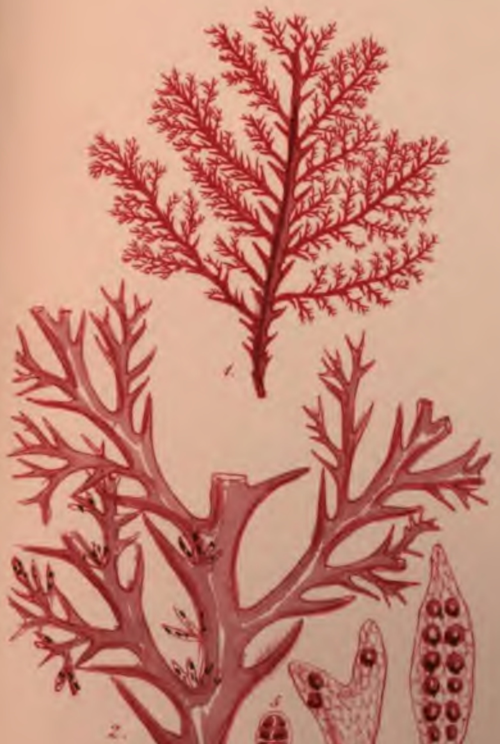
W.H.H. del et lith.

R.B.&R. imp.

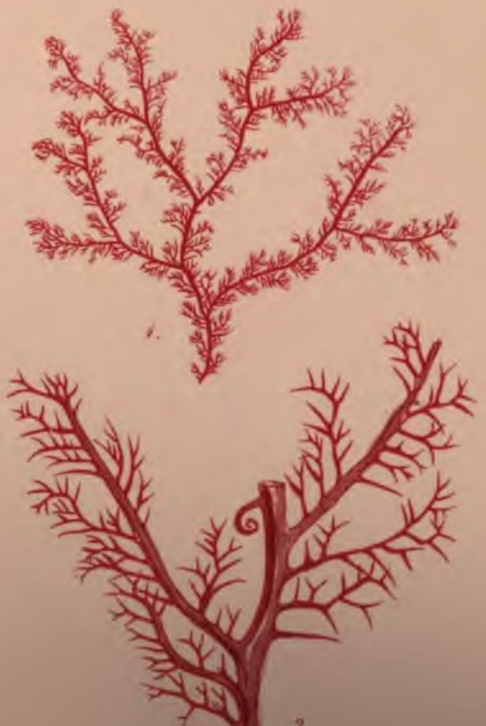
Tab. XLIII.



Martensia elegans.



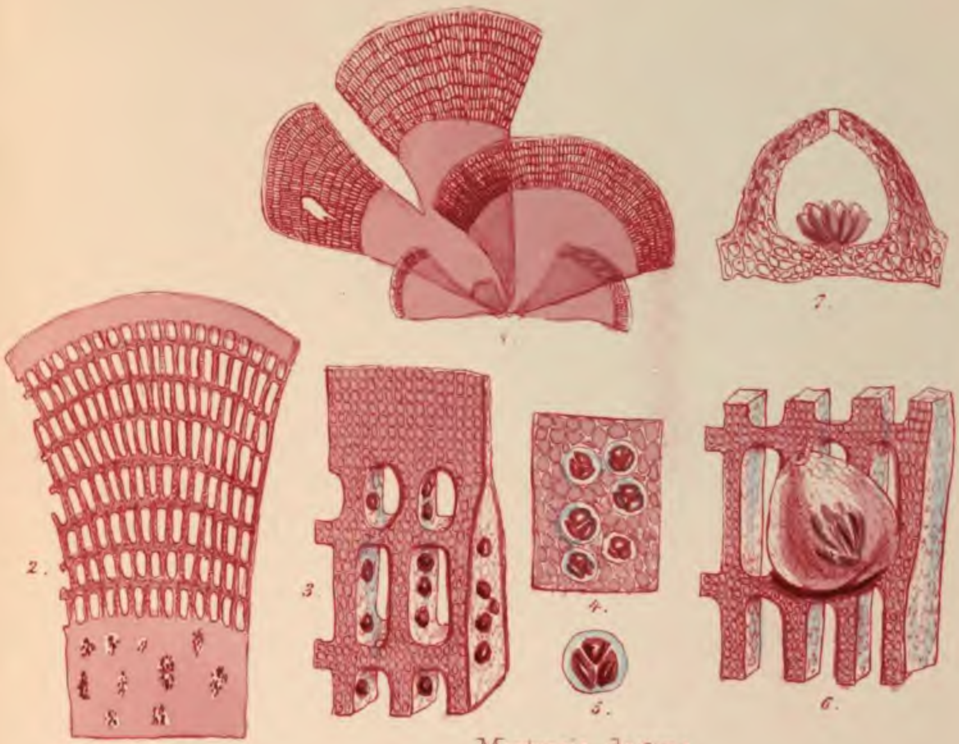
Plocamium abnorme.



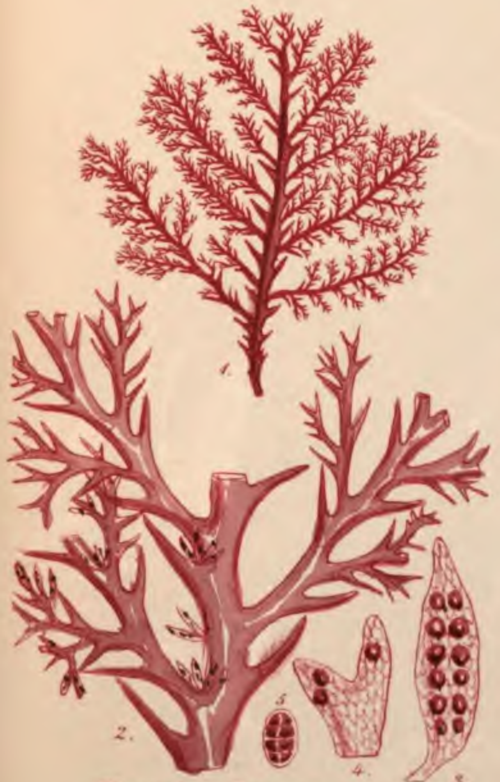
Plocamium flexuosum.

W.H.H. del et lith.

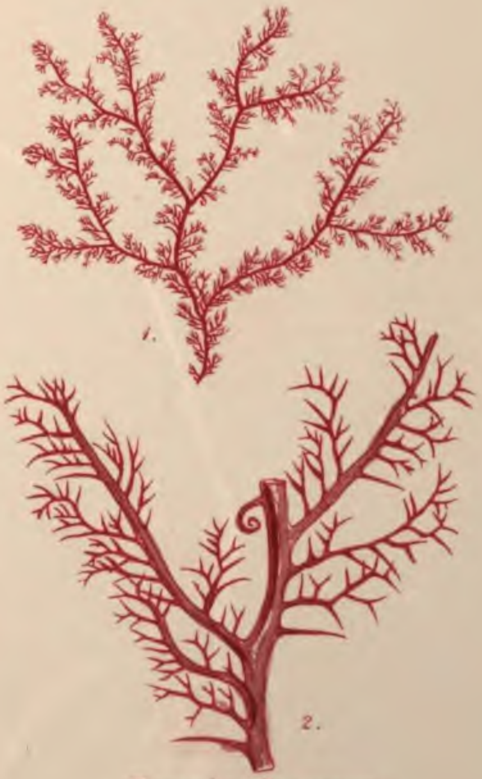
Tab. XLIII.



Martensia elegans.



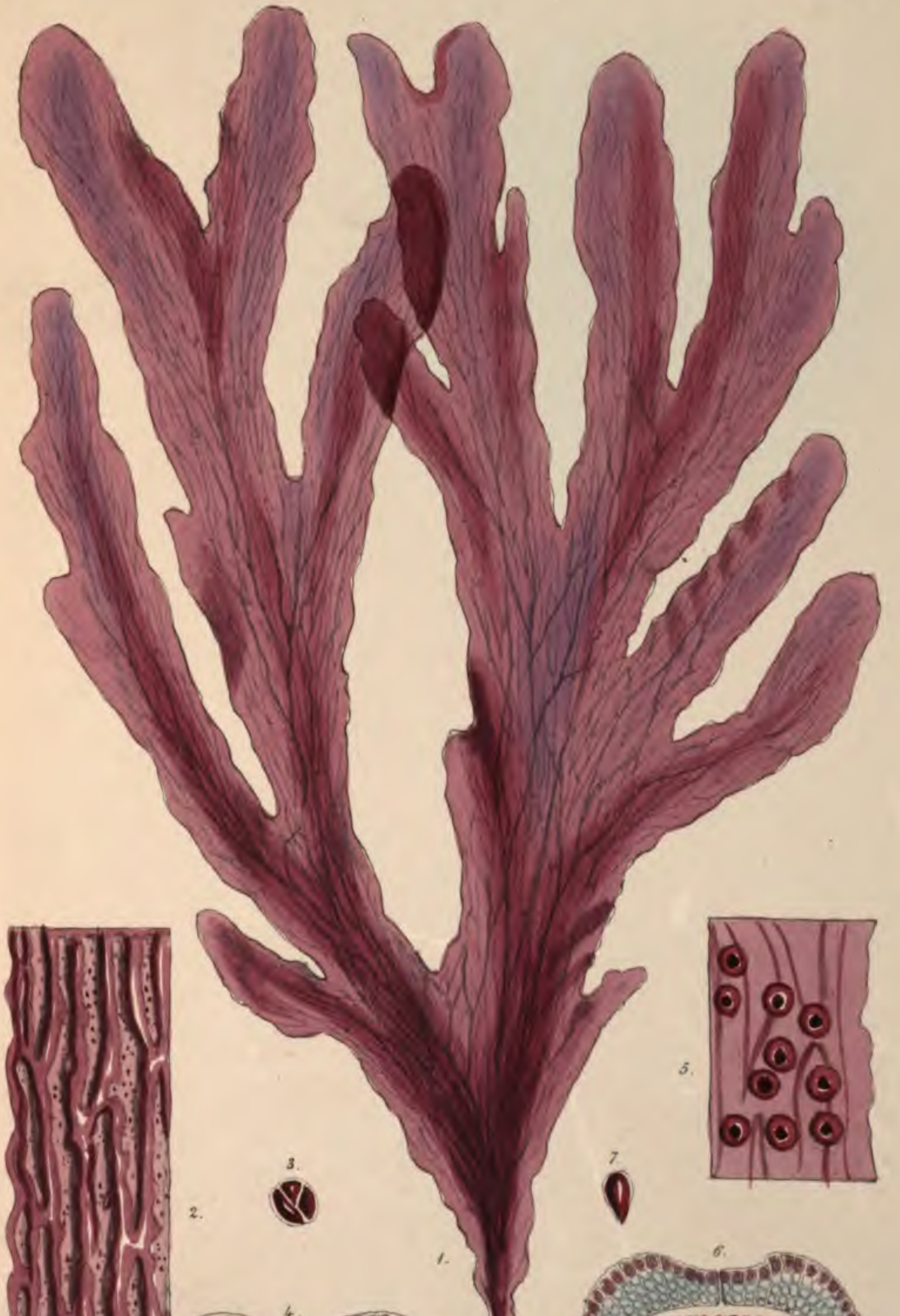
Plocamium abnorme.



Plocamium flexuosum.

W.H.H. del et lith.
R.B & R. imp.

Tab. XLIV.

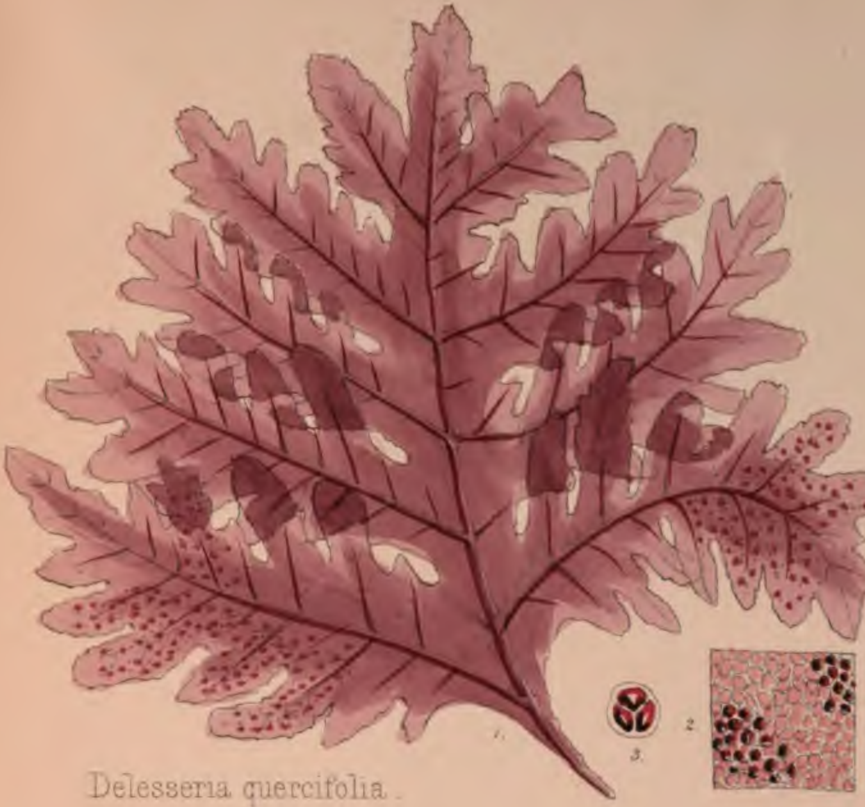


Hymenena fissa.

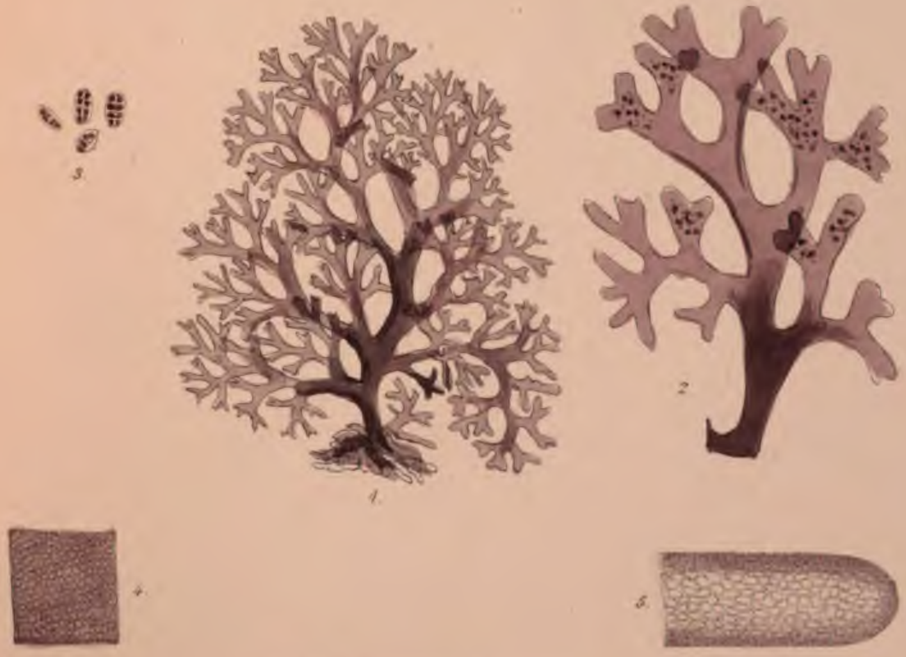
W.H.H. del et lith.

R.B. & R. imp.

Tab. XLVI.



Delesseria quercifolia.



Rhodymenia nigricans.

W.H.H. del et lith.

R.B. & R. imp.

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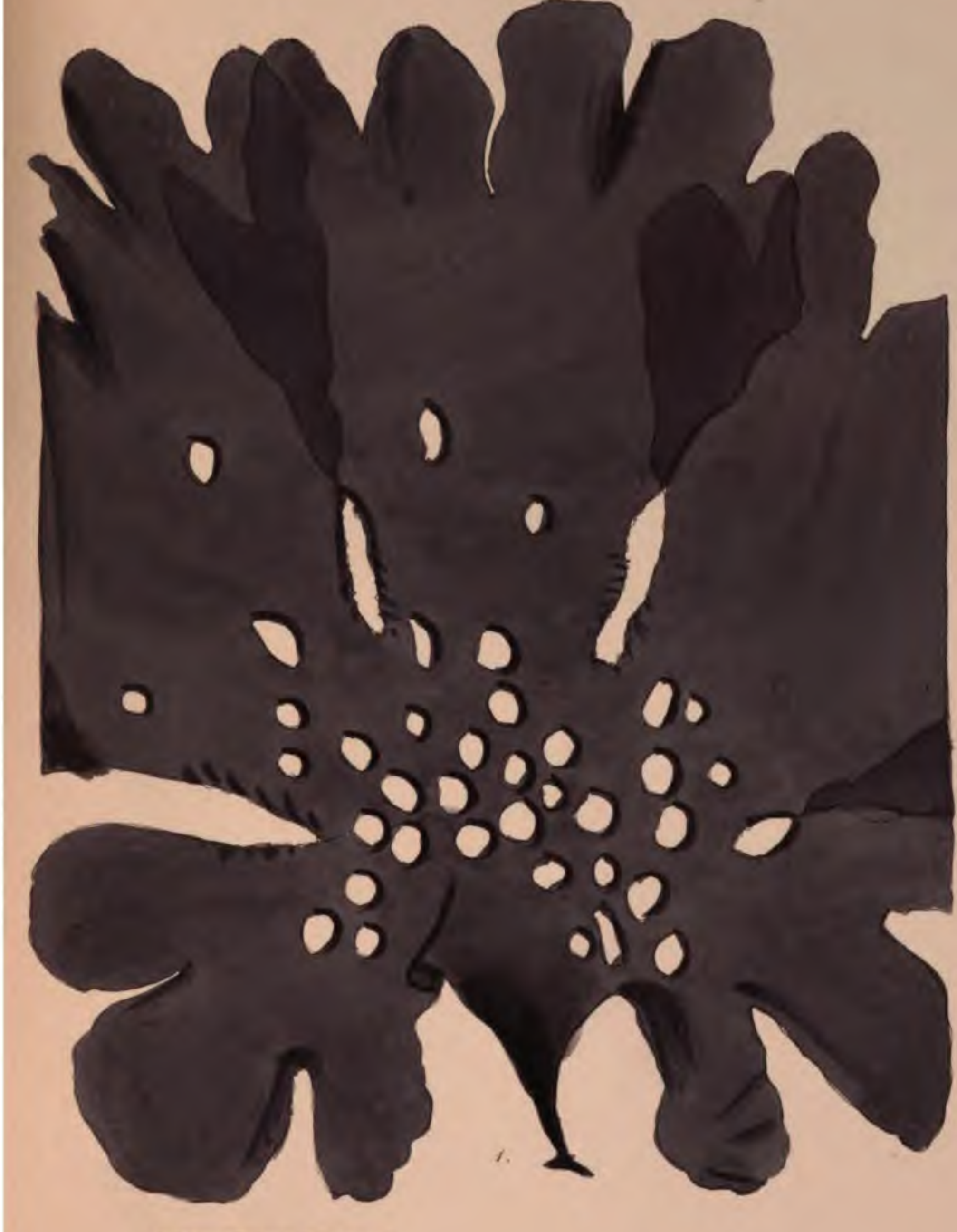
Tab. XLVII.



1.

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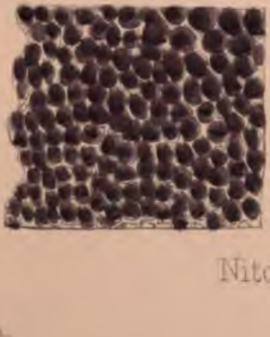


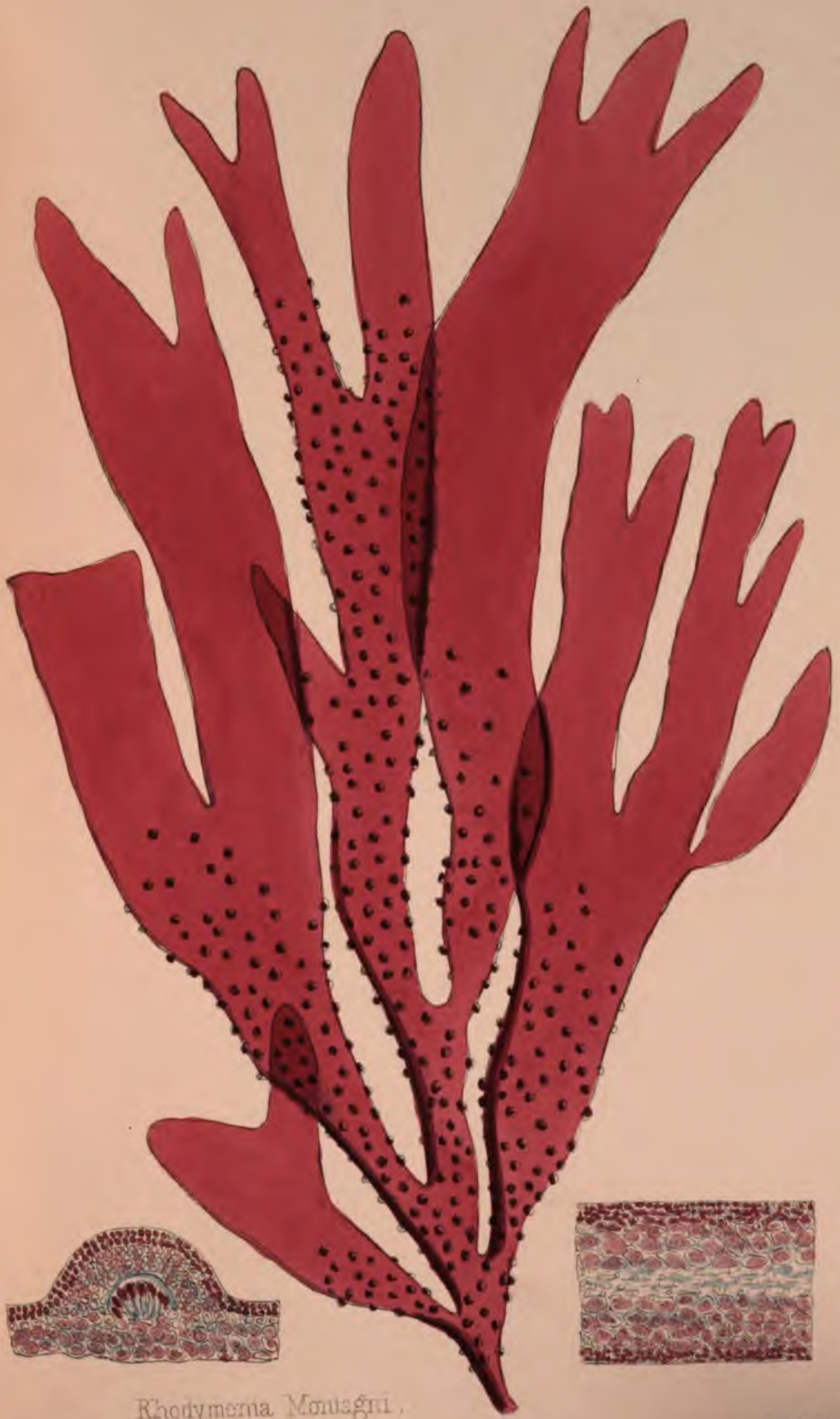
3.

Nitophyllum Gunnianum.

W. H. H. del et lith.

R. B. & R. imp.

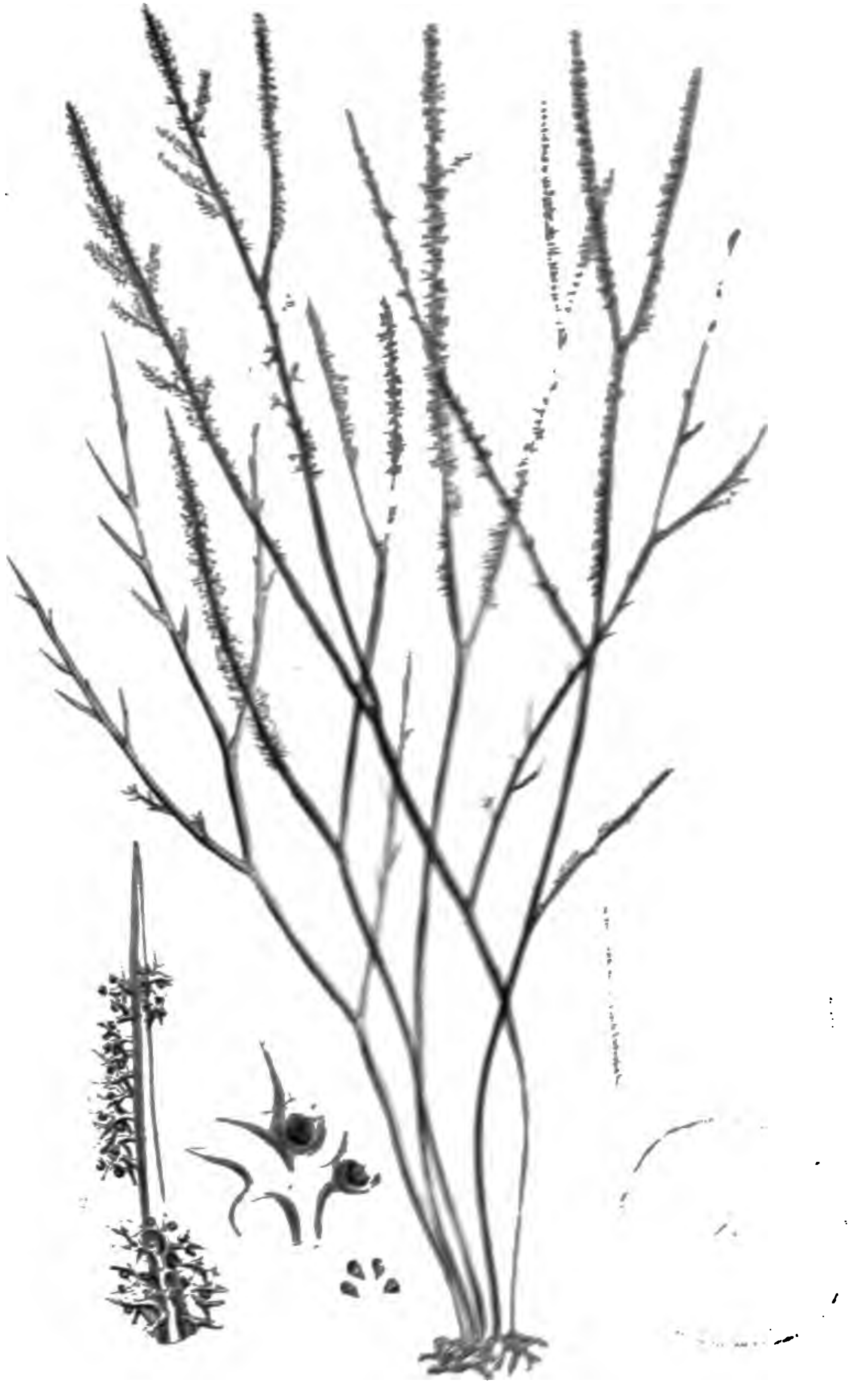
Tab. XLVIII.



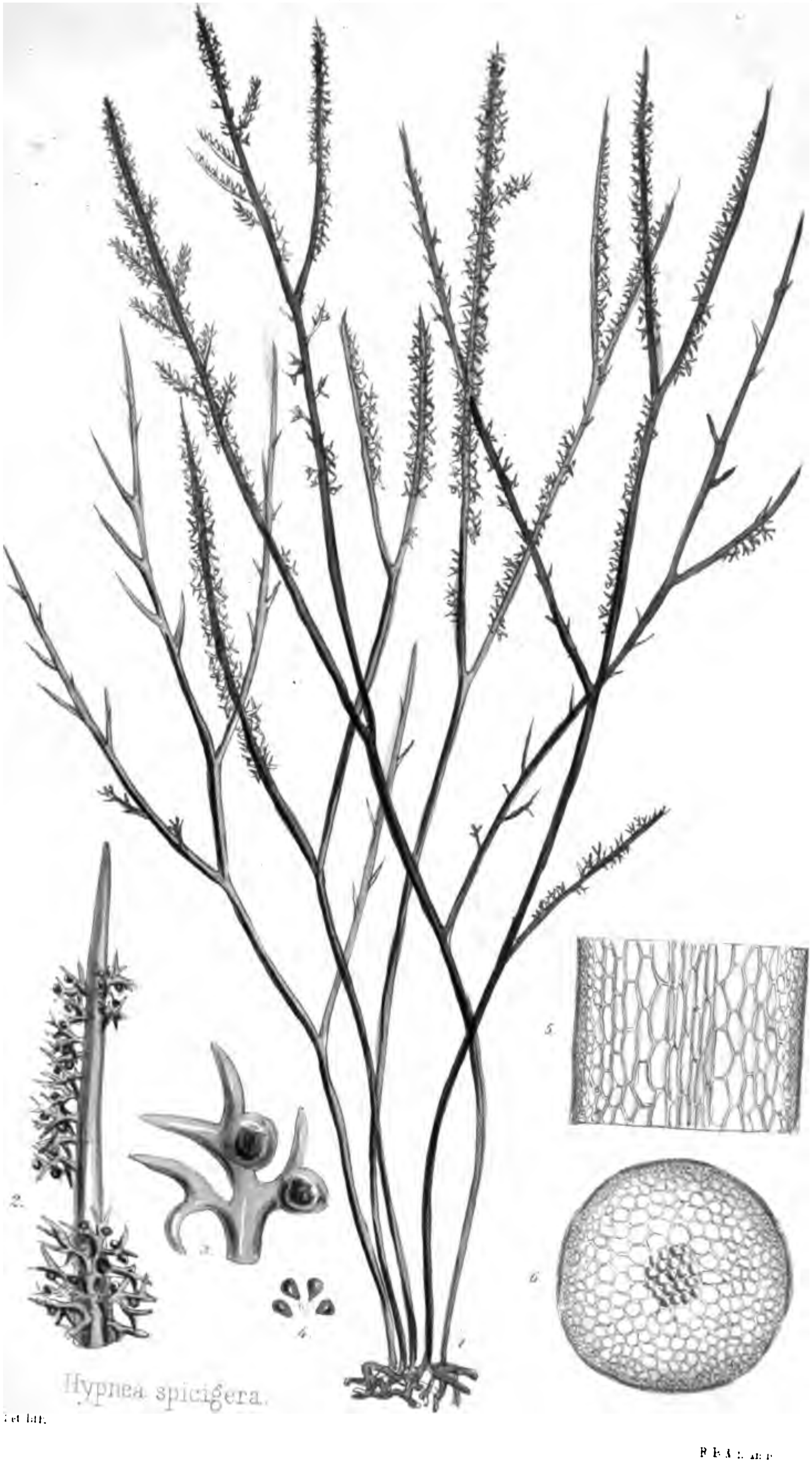
Rhodymenia Montagni.

W.H.H. del et lith.

R. B. & R. imp.



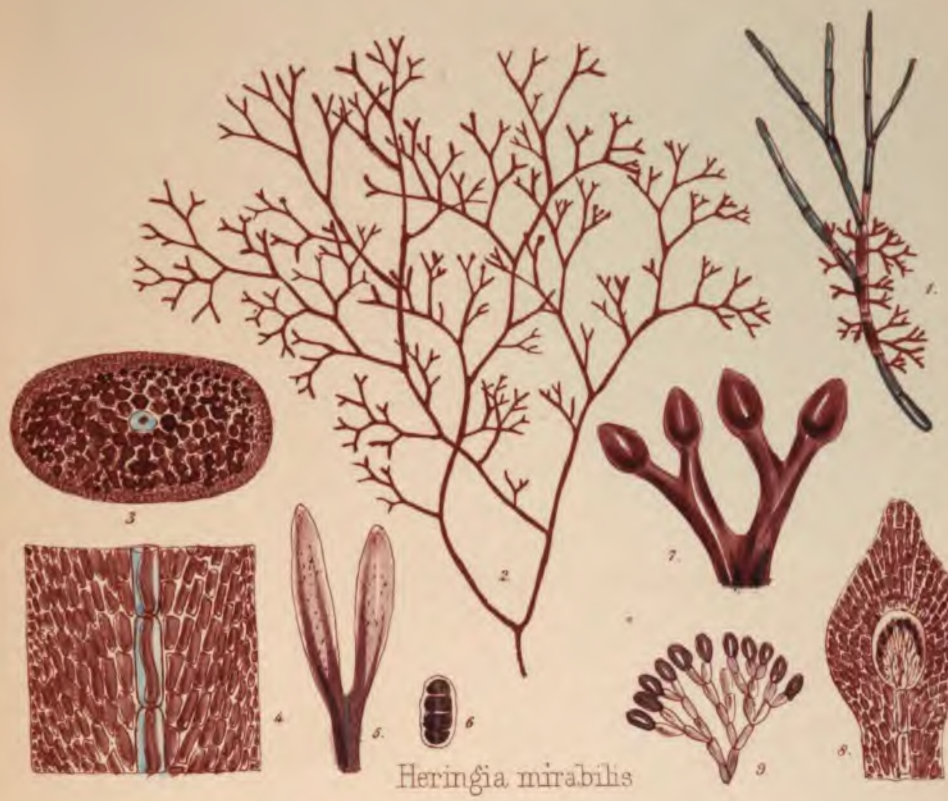
Tab. XLIX.



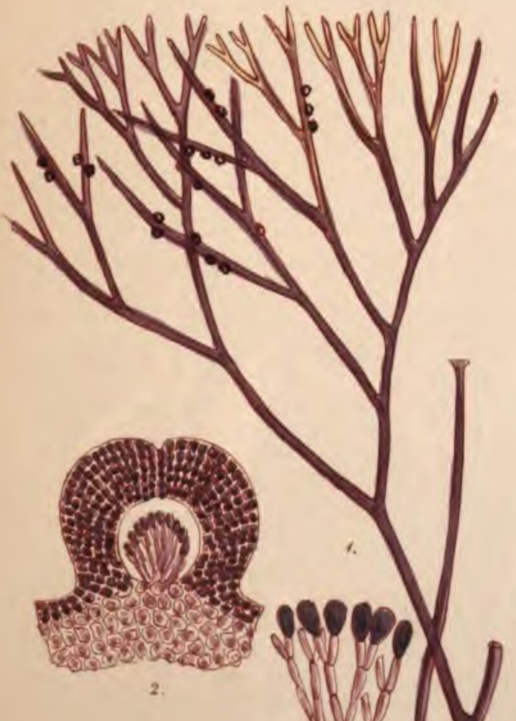
Hypnea spicigera.

W. H. H. ad nat. lith.

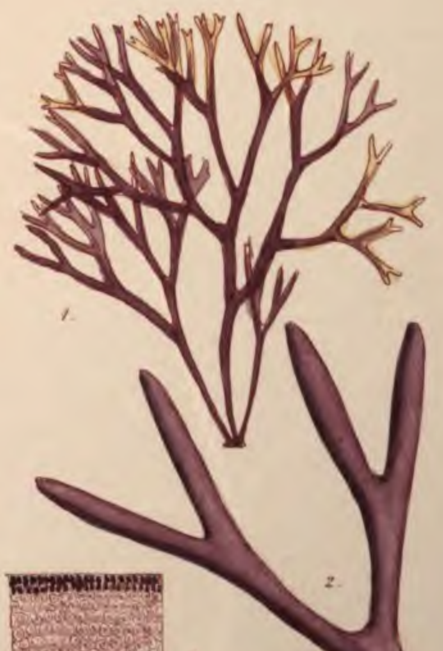
R. B. & R. imp.



Heringia mirabilis



Dicurella elatior.



Dicurella flabellata.

WHH del. et lith.

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